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Note by the President of the Security Council

In paragraph 2 of resolution 1984 (2011), the Security Council requested the Panel of Experts established pursuant to resolution 1929 (2010) to provide a final report to the Council with its findings and recommendations.

Accordingly, the President hereby circulates the report dated 4 June 2012 received from the Panel of Experts (see annex).

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Annex

Letter dated 4 June 2012 from the Panel of Experts established pursuant to resolution 1929 (2010) addressed to the President of the Security Council

On behalf of the Panel of Experts established pursuant to Security Council resolution 1929 (2010), I have the honour to transmit herewith, in accordance with paragraph 2 of resolution 1984 (2011), the final report on its work.

(*Signed*) Salomé **Zourabichvili**
Coordinator
Panel of Experts established pursuant to resolution 1929 (2010)

(*Signed*) Jonathan **Brewer**
Expert

(*Signed*) Kenichiro **Matsubayashi**
Expert

(*Signed*) Thomas **Mazet**
Expert

(*Signed*) Jacqueline **Shire**
Expert

(*Signed*) Elena **Vodopolova**
Expert

(*Signed*) Olasehinde Ishola **Williams**
Expert

(*Signed*) Wenlei **Xu**
Expert

Final report of the Panel of Experts established pursuant to resolution 1929 (2010)

Summary

The present final report is submitted pursuant to Security Council resolution 1984 (2011) and in accordance with the mandate set forth in paragraph 29 of resolution 1929 (2010). It contains the analysis, conclusions and recommendations of the Panel of Experts established pursuant to resolution 1929 (2010) regarding compliance by the Islamic Republic of Iran with the provisions of that and related resolutions, in addition to information provided by Member States regarding their implementation. The Panel draws on consultations with Member States and experts, inspections of reported incidents of non-compliance and assessments of implementation reports submitted by Member States under resolution 1929 (2010). The report also contains a discussion of other work undertaken by the Panel relevant to its mandate, including outreach activities to Member States, regional groups and the private sector and, where appropriate, the provision of technical advice.

The sanctions measures specified in resolution 1929 (2010) and previous resolutions are part of a coordinated and intensive effort by the international community to persuade the Islamic Republic of Iran to resolve outstanding questions about the nature of its nuclear programme and demonstrate that it is for purely peaceful purposes. Sanctions remain one element of a dual-track approach to the country, which includes diplomatic efforts by China, France, Germany, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America. These sanctions are targeted at specific activities, institutions, entities and individuals related to the Islamic Republic of Iran's prohibited proliferation-sensitive nuclear activities and development of a nuclear weapon delivery system, in addition to transfers of conventional weapons.

Sanctions are slowing the procurement by the Islamic Republic of Iran of some critical items required for its prohibited nuclear programme. At the same time, prohibited activities, including uranium enrichment, are continuing. The Islamic Republic of Iran has still not complied with the requests of the International Atomic Energy Agency for information to clarify the possible military dimensions of its programme. In the present report, the Panel identifies the acquisition of high-grade carbon fibre as one of a number of critical items that the Islamic Republic of Iran requires for the development of more advanced centrifuges. The report also contains an analysis of the country's requirements for uranium ore in the context of its current and future planned activities, while noting that no procurement attempts have been reported to the Security Council Committee established pursuant to resolution 1737 (2006).

The Iranian ballistic missile programme continues to develop, as demonstrated by additional launches, their prohibition under resolution 1929 (2010) notwithstanding. In the present report, the Panel provides the conclusions of its investigation into the June 2011 launch of the Rasad satellite, which was reported to the Committee.

The Panel takes note of the recent designations by the Security Council Committee established pursuant to resolution 1718 (2006) concerning the Democratic People's Republic of Korea of two Democratic People's Republic of Korea entities and their links to the Iranian ballistic missile programme.

The Islamic Republic of Iran has continued to defy the international community through illegal arms shipments. Three interdictions of conventional arms or related materiel are identified in the present report. Two of these involve the Syrian Arab Republic, as did most of the cases inspected by the Panel during its previous mandate, underscoring that the Syrian Arab Republic continues to be the central party to illicit Iranian arms transfers. The Panel recommends the designation of two entities related to these interdictions.

The Panel also takes note of information received concerning arms shipments by the Islamic Republic of Iran to other destinations.

The Panel highlights the challenges in identifying specific transactions or businesses involving Islamic Revolutionary Guards Corps entities that could contribute to the country's proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems. It also describes the involvement of an Islamic Revolutionary Guards Corps entity in a transfer of conventional arms reported to the Committee.

The transportation sector offers unique challenges for sanctions implementation. The report details the complex structure of the Islamic Republic of Iran Shipping Lines, with its frequent changes in ownership, names or national flags of vessels, and whose activities are subject to vigilance under paragraph 22 of resolution 1929 (2010). This is illustrated in the case of the Irano Hind Shipping Company, an Islamic Republic of Iran Shipping Lines entity, which was designated under resolution 1929 (2010) and whose vessels continue to operate.

The Panel concludes that financial sanctions have been implemented by many Member States with rigour and welcomes the new Financial Action Task Force standard on financing of proliferation.

The Panel underscores the growing level of awareness among Member States of the importance of strong export controls in the implementation of sanctions. The Panel identified small and medium-sized enterprises as an attractive target of Iranian illicit procurement attempts, and highlighted the importance of outreach to such enterprises for effective implementation of export controls.

Interdictions of prohibited shipments are vital for slowing the Islamic Republic of Iran's proliferation-sensitive nuclear and ballistic missile activities and preventing arms transfers from the country. The Panel recognizes the value of sharing intelligence and cooperation among Member States in successful interdictions.

The Panel is aware of interdictions, of which only a few have been reported to the Committee. The Panel wishes to underline that this reporting is central to its ability to analyse patterns of procurement and illicit activity and develop recommendations. Information regarding denials of export licences for sensitive items, or attempted transfers identified by vigilant Customs authorities, is equally important.

During consultations with Member States, those that were not members of the Security Council raised the issue of the availability of the Panel's 2011 final report, which they suggested would be useful in having a better understanding of sanctions implementation and improving national measures.

Although there remain examples of Member States who have yet to implement United Nations sanctions fully, the Panel is encouraged by the high level of commitment among most of its interlocutors to the effective implementation of the sanctions contained in Security Council resolution 1929 (2010).

I. Introduction

1. The present report has been prepared in accordance with the Panel's mandate as set forth in paragraph 29 of resolution 1929 (2010), and renewed in resolution 1984 (2011) on 9 June 2011. It contains a summary of the Panel's work over the past 11 months in the areas of inspections of reported sanctions violations, consultations with Member States, outreach to Member States and the private sector, and discussions with outside experts. These activities are described in further detail in paragraphs 16 to 42.

2. The Panel consists of eight members, who were reappointed by the Secretary-General on 30 June 2011 (S/2011/405). The Panel's composition is as follows: Salomé Zourabichvili (France), Coordinator; Jonathan Brewer (United Kingdom of Great Britain and Northern Ireland); Kenichiro Matsubayashi (Japan); Thomas Mazet (Germany); Jacqueline Shire (United States of America); Elena Vodopolova (Russian Federation); Olasehinde Ishola Williams (Nigeria); and Wenlei Xu (China).

3. The Panel operates under the direction of the Security Council Committee established pursuant to resolution 1737 (2006). The mandate of the Panel, as set forth in paragraph 29 of resolution 1929 (2010), is:

(a) To assist the Committee in carrying out its mandate as specified in paragraph 18 of resolution 1737 (2006) and paragraph 28 of resolution 1929 (2010);

(b) To gather, examine and analyse information from Member States, relevant United Nations bodies and other interested parties regarding the implementation of the measures decided in resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1929 (2010), in particular incidents of non-compliance;

(c) To make recommendations on actions the Council, or the Committee or the State, may consider to improve implementation of the relevant measures;

(d) To provide a final report to the Council no later than 30 days prior to the termination of its mandate, with its findings and recommendations.

In its resolution 1984 (2011), the Security Council extended the mandate of the Panel until 9 June 2012.

4. In its resolution 1929 (2010), the Security Council sought to strengthen and build upon the measures contained in resolutions 1737 (2006), 1747 (2007) and 1803 (2008), with a view to persuading the Islamic Republic of Iran to comply with its Security Council obligations. Measures imposed by the Security Council on the Islamic Republic of Iran include:

(a) An embargo on proliferation-sensitive nuclear and ballistic missile activities (resolution 1737 (2006), paras. 3-7 and 9; resolution 1803 (2008), para. 8; and resolution 1929 (2010), paras. 7, 9 and 13);

(b) An arms embargo (resolution 1747 (2007), para. 5; and resolution 1929 (2010), para. 8);

(c) A travel ban (resolution 1929 (2010), para. 10);

(d) An asset freeze (resolution 1737 (2006), paras. 12-15; resolution 1747 (2007), para. 4; resolution 1803 (2008), para. 7; and resolution 1929 (2010), paras. 11, 12 and 19);

(e) Other business restrictions (resolution 1929 (2010), para. 22);

(f) The seizure and disposal of proscribed items, following inspections of cargo (resolution 1929 (2010), paras. 14-17);

(g) A ban on the provision of bunkering services (resolution 1929 (2010), para. 18);

(h) Financial-related measures (resolution 1747 (2007), para. 7; resolution 1803 (2008), paras. 9 and 10; and resolution 1929 (2010), paras. 21, 23 and 24; in addition to the sixteenth preambular paragraph of resolution 1929 (2010));

(i) Other requests and calls to Member States (resolution 1737 (2006), para. 17; and resolution 1929 (2010), para. 20).

A. Methodology

5. The Panel carried out its tasks on the basis of the mandate stipulated in paragraph 29 of resolution 1929 (2010) and the directions given by the Committee, mindful of the methodological standards contained in the report of the Informal Working Group of the Security Council on General Issues of Sanctions (S/2006/997) and further described in the publication *Best Practices and Recommendations for Improving the Effectiveness of United Nations Sanctions*, which is based on that report.

6. In fulfilling its mandate, the Panel, as an independent expert body, sought to meet the required high evidentiary methodological standards. The Panel endeavoured to ensure that its findings were substantiated, and that the information contained in its reports derived from credible sources, was as transparent and verifiable as possible and, in the case of reported violations of sanctions, included wherever possible first-hand, on-site observations by the experts themselves. The Panel was also mindful of the importance of maintaining the confidentiality of sources of information, when requested. The Panel's decisions were arrived at by consensus and, where there were differences in conclusions, the majority carried and dissenting views were reflected.

B. Background

7. The political and economic environment in which the international community is implementing its obligations under resolution 1929 (2010) has undergone significant changes over the past year. Economies are struggling to overcome economic downturns amid rising energy prices. The Panel's focus was to assess the implementation of targeted Security Council sanctions and understand their impact against that shifting background.

8. Over the same period, significant questions remained regarding the peaceful nature of the Iranian nuclear programme. In its most recent reports, the International Atomic Energy Agency (IAEA) highlighted concerns regarding possible military dimensions of the programmes (see GOV/2011/65, para. 53).

9. Although provocative statements and actions have at times affected the international climate and increased tensions over the past year, there has been progress in recent months in finding a negotiated solution to the Iranian nuclear issue.

10. Negotiations between the Islamic Republic of Iran and the "E3 + 3" group of countries (China, France, Germany, the Russian Federation, the United Kingdom and the United States) have restarted. In a letter dated 19 October 2011, Catherine Ashton, High Representative of the European Union for Foreign Affairs and Security Policy, welcomed the Islamic Republic of Iran's suggestion to resume talks. The country responded positively on 15 February 2012 and talks were held in Istanbul, Turkey, on 14 April 2012. Ms. Ashton described the talks as constructive and useful. The Minister for Foreign Affairs of the Islamic Republic of Iran, Aliakbar Salehi, said that Istanbul was the beginning for ending the nuclear dispute.[1] A second round of talks took place on 23 May 2012 in Baghdad.

11. Security Council resolutions are targeted at specific activities, institutions, entities and individuals related to the Islamic Republic of Iran's prohibited nuclear and missile activities, and conventional arms imports and exports. It is difficult to assess their impact, in particular measured against stronger and more comprehensive sanctions imposed by Member States unilaterally.

12. Unilateral sanctions are an issue that Member States raise regularly with the Panel in the context of their implementation of targeted Security Council sanctions. A number of Member States, which implement only these sanctions, have expressed concern to the Panel that unilateral sanctions have a negative impact on legitimate economic activities allowed under United Nations sanctions.

13. The impact of sanctions on the Iranian economy is sometimes difficult to distinguish from the impact of domestic economic policies, in particular the effects of cuts to long-standing consumer subsidies initiated in 2010. There are growing signs, however, that sanctions are having an impact, including through rising prices and a devaluing currency. According to an announcement by the Central Bank of Iran on 4 March 2012, the Iranian inflation rate stood at 21.5 per cent.[2]

14. Statements by senior Iranian officials on the impact of sanctions have shifted over the past 12 months. Although such statements in 2011 downplayed their impact, the Supreme Leader of the Islamic Republic of Iran, Ayatollah Ali Khamenei, was quoted in February 2012 as calling sanctions "painful and crippling".[3]

C. Acknowledgments

15. The Panel wishes to acknowledge the high degree of cooperation received from many Member States during the course of its work. It also acknowledges the excellent and sometimes proactive engagement of many private-sector entities.

II. Activities of the Panel

16. The Panel's activities were developed and carried out in conformity with its programme of work for the period 9 June 2011-8 June 2012, as required under

[1] "Several steps forward will be taken in Iran-5+1 talks in Baghdad: Salehi", *Tehran Times*, 29 April 2012.

[2] "Iran's inflation rate hits 21.5 per cent", *Tehran Times*, 8 April 2012.

[3] Robert F. Worth and David E. Sanger, "U.N. nuclear inspectors' visit to Iran is a failure, West says", *New York Times*, 3 February 2012.

paragraph 3 of resolution 1984 (2011). The Panel submitted to the Committee its midterm report on 9 November 2011, in addition to four inspection and investigation reports and four quarterly assessments of Member State implementation reports as required under paragraph 31 of resolution 1929 (2010) (see annex I). During its current mandate, the Panel held consultations with 26 Member States and investigated four reported incidents of non-compliance. A full list of the countries visited can be found in annex II to the present report. The Panel attended informal consultations of the Committee on 16 June 2011, 7 December 2011 and 29 February 2012.

A. Consultations

17. The Panel's plan of visits reflected its priorities to consult members of the Security Council, Member States involved in the diplomatic process, bordering or regional Member States and those Member States hosting relevant international organizations. The Panel expanded the geographic breadth of its consultations during the current mandate to reflect the global extent of Iranian interests and activities related to sanctions.

18. A positive development observed by the Panel in the course of its consultations with Member States over the past year was a marked increase in awareness regarding sanctions implementation and the need for strengthened export controls and for vigilance over specific sectors of business activity. Although some Member States remain without sufficient capacity to implement United Nations sanctions fully, the Panel is encouraged by the high level of commitment among most of its interlocutors to the effective implementation of the sanctions contained in resolution 1929 (2010).

19. During some consultations, the Panel had the opportunity to visit major ports and receive briefings from Customs and port authorities directly involved in the enforcement of measures under the relevant Security Council resolutions. Such visits included the maritime ports of Antwerp (Belgium), Constanta (Romania), Hai Phong (Viet Nam), Jebel Ali (United Arab Emirates), Klang (Malaysia), Odessa (Ukraine) and Singapore, and the airports of Madrid (Spain), Oslo (Norway) and Sofia (Bulgaria). These visits deepened the Panel's understanding of enforcement and implementation issues related to export controls, Customs and transportation.

20. The Panel carried out its tasks in consultation with United Nations experts belonging to the United Nations Office for Disarmament Affairs, the United Nations Institute for Disarmament Research, the United Nations Conference on Trade and Development, the United Nations Office on Drugs and Crime, the Economic Commission for Europe, the United Nations Office for Outer Space Affairs, the International Civil Aviation Organization and, as appropriate, experts and panels of experts working under other Security Council resolutions, including resolutions 1540 (2004) and 1874 (2009).

21. The Panel also met representatives from other international organizations to obtain information concerning implementation measures under the relevant Security Council resolutions and related issues. These included the European Union, the North Atlantic Treaty Organization, the International Criminal Police Organization, the World Customs Organization and the International Organization for Migration.

B. Outreach and related activities

22. From the beginning of its mandate, the Panel identified outreach as a priority. Consistent with the Committee's direction and encouragement of such activities, the Panel proactively contacted Member States and organizations in the private sector relevant to sanctions implementation, in addition to individual experts and non-governmental organizations.

23. The Panel worked with local and international think tanks to organize regional seminars bringing together practitioners and experts to discuss the implementation of United Nations resolutions and the challenges that they pose. Four such seminars, supported by Norway, Switzerland and the United Kingdom, were held during the Panel's current mandate. They took place as follows:

(a) In Istanbul, on 17 and 18 November 2011, organized in collaboration with the International Institute for Strategic Studies (IISS);

(b) In Geneva, on 15 and 16 March 2012, with the support of the Geneva Centre for Security Policy;

(c) In Singapore, on 12 and 13 April 2012, with IISS;

(d) In Nairobi, on 22 and 23 May 2012, organized by IISS and the Institute for Security Studies, focusing on conventional arms transfer issues in the Horn of Africa.

24. The Panel was also invited to participate in conferences and seminars relevant to its mandate, including the Asian Senior-level Talks on Non-Proliferation; the Asian Export Control Seminar; plenary meetings of the Financial Action Task Force and meetings of some of its working groups; a seminar on conventional weapons transfers organized by the Stockholm International Peace Research Institute; a seminar at the Australian National University; an export control seminar in Belarus; and a conference on combating the financing of the proliferation of weapons of mass destruction, hosted by the Ministry of Foreign Affairs and Trade of the Republic of Korea. It was also invited to participate in events organized by the Stimson Center, Chatham House, Wilton Park, the EU Non-Proliferation Consortium, the Group of Eight Non-proliferation Directors Group and the British Bankers' Association.

25. The Panel held discussions with experts affiliated to governmental and non-governmental think tanks and universities. These included IISS, the Institute for Science and International Security, the Carnegie Endowment for International Peace, Columbia University in the City of New York, Massachusetts Institute of Technology, Princeton University, RAND Corporation, King's College London, the Brazilian Center for International Relations, the BRICS Policy Center, the Stockholm International Security and Peace Research Institute and the Geneva Centre for Security Policy.

26. The Panel also met representatives of many private companies and entities in Europe, Asia and the United States involved in the implementation of sanctions on the Islamic Republic of Iran. These included Bluestar Fibres Company Limited, Citigroup, Oerlikon Leybold, Freshfields Bruckhaus Deringer, JP Morgan Chase & Co., Zurich Insurance Group, Axa Group, INFICON Holding, Kelvin Hughes, TNT Express, the Society for Worldwide Interbank Financial Telecommunication

(SWIFT), the International Group of P&I Clubs, the International Air Transport Association and Maersk.

C. Assessment of implementation reports

27. As requested by the Committee in its programme of work, the Panel submitted four quarterly assessments of implementation reports: on 29 July 2011, 31 October 2011, 31 January 2012 and 30 April 2012. These assessments showed that approximately 60 per cent of Member States had not reported under resolution 1929 (2010). The Panel concluded that the reports would be more informative and relevant to its work if they contained details regarding implementation in practice, albeit on a voluntary basis.

28. The Panel stands ready to assist the Committee to hold a planned open briefing to inform Member States of the activities of the Panel and the Committee, as agreed by the Committee on 4 March 2011 and 7 December 2011.

D. Inspections of reported incidents

29. The Panel investigated four reported incidents of non-compliance during its current mandate, two of which were reported to the Committee during the Panel's previous mandate. The Panel completed three physical inspections and one investigation.[4] Three of four reported cases concerned violations of paragraph 5 of resolution 1747 (2007), pertaining to arms and related materiel exports from the Islamic Republic of Iran, and one of paragraph 9 of resolution 1929 (2010). The following provides background to and summarizes the Panel's key findings in each case.

30. The Panel wishes to highlight the strong cooperation that it has received from all reporting Member States, in particular Turkey, which has reported several violations. The Panel wishes to emphasize the positive example set by reporting Member States.

1. International Security Assistance Force (Afghanistan)

31. The seizure of a shipment of rockets, fuses and ammunition in southern Afghanistan on 5 February 2011 was reported to the Committee by the United Kingdom on 21 April 2011. Following the seizure, the bulk of the shipment was destroyed. Samples of the rockets and fuses were shipped to the United Kingdom for forensic examination and, on 26 September 2011, made available to the Panel for inspection.

32. This inspection was unusual because the Panel was unable to visit the site of the seizure, only a small part of the original shipment was available for inspection and no documents were available. The Panel concluded, on the basis of its investigation and the information provided by the United Kingdom, that there was a

[4] Inspection teams generally consist of from two to four Panel experts. In the present report, references are to "the Panel" and not "members of the Panel", as all inspections and the subsequent reports engage the Panel as a whole. References are made to "members of the Panel" only in cases of dissenting views.

high probability that the shipment of the 122-mm rockets constituted a violation by the Islamic Republic of Iran of paragraph 5 of resolution 1747 (2007). To substantiate this conclusion, the Panel continues to investigate this incident and invites Member States to supply further relevant information.

2. Yas Air (Turkey)

33. On 19 March 2011, the Turkish authorities seized 19 crates containing assault rifles, machine guns, ammunition and mortar shells from an Ilyushin-76 cargo aircraft operated by an Iranian cargo airline, Yas Air. The flight originated in the Islamic Republic of Iran and was bound for the Syrian Arab Republic. This interdiction was reported by Turkey to the Committee on 28 March 2011 and was supplemented by a detailed inventory of the cargo transmitted to the Committee on 7 July 2011.

34. The Panel travelled to Diyarbakir on 19 November 2011 to inspect the shipment. It concluded that the items seized constituted a violation of paragraph 5 of resolution 1747 (2007).

3. Safir/Rasad launch

35. Following a communication by four Member States on 15 July 2011, the Panel investigated a launch by the Islamic Republic of Iran of the Rasad satellite on 15 June 2011 to determine whether the launch constituted a violation of paragraph 9 of resolution 1929 (2010).

36. The Panel noted that the Safir space launch vehicle itself was not designed to carry a nuclear weapon. The majority of the Panel concluded that the satellite launch was related to ballistic missiles capable of delivering nuclear weapons, based on the space launch vehicle's derivation from two nuclear-capable missiles (the Shahab-3 and the R-27 submarine-launched ballistic missile in its second stage). Three members of the Panel concluded that the launch was not an activity related to a ballistic missile capable of delivering nuclear weapons. The majority of the Panel also concluded that the Safir space launch vehicle made use of ballistic missile technology, and therefore constituted a violation of paragraph 9 of resolution 1929 (2010). Two members of the Panel believed that it was difficult to reach such a firm conclusion.

4. Kilis (Turkey)

37. On 15 February 2011, the Turkish authorities seized a truck carrying explosives originating in the Islamic Republic of Iran and bound for the Syrian Arab Republic. The seizure was reported to the Committee on 12 January 2012. From 4 to 7 March 2012, the Panel physically inspected the seized materials and accompanying documents at an ammunition depot in Osmaniye Province, southern Turkey.

38. The Panel concluded that the shipment constituted a violation by the Islamic Republic of Iran of paragraph 5 of resolution 1747 (2007).

E. Challenges

39. The Panel recalls the need to report promptly to the Committee incidents of non-compliance. Some Member States have reported that domestic legal proceedings

conflict with their United Nations reporting obligations. Such conflicts should be reconciled by Member States, including by sending initial confidential reports of non-compliance to the Committee without delay.

40. The Panel is also aware of incidents, reported in the media and acknowledged by Government officials in public statements, which may be violations. The Panel reiterates its readiness to investigate such cases.

41. There are several reasons why interdictions may not be reported, including the disclosure of sensitive intelligence sources and methods and requirements of local law enforcement processes. The Panel appreciates the importance of such considerations, while also noting that reports to the Committee provide valuable information in support of the Panel's mandate. They also send a strong signal to Member States that the Islamic Republic of Iran continues to violate sanctions and that Member States are taking preventative action accordingly.

42. The issue of safe storage and disposal of interdicted items came to the forefront during the Panel's current mandate with the explosion of materiel stored by a Member State following its removal from the *M/V Monchegorsk*. This tragic event underscores the need for safe storage and a prompt invitation to the Panel to carry out an inspection, thereby allowing for expeditious disposal of the interdicted items.

III. Analysis

A. Nuclear materials and technology

1. Introduction

43. In its resolution 1929 (2010), the Security Council barred the supply, sale or transfer to the Islamic Republic of Iran of sensitive nuclear materials and technology, including all items listed in INFCIRC/254/Rev.9/Part 1, in addition to the dual-use items contained in INFCIRC/254/Rev.7/Part 2, with the exception of those items specified in paragraph 5 of resolution 1737 (2006) and any further items if the State determined that they could contribute to enrichment-related, reprocessing or heavy water-related activities or to the development of nuclear weapon delivery systems.[5] The Council also decided that the Islamic Republic of Iran was not to acquire an interest in any commercial activity in another State involving uranium mining, production or use of nuclear materials or ballistic missiles.

44. In addition, the Security Council affirmed that the Islamic Republic of Iran should take the steps required by the Board of Governors of IAEA, among other things, to build confidence in the exclusively peaceful purpose of its nuclear programme, and should cooperate fully with IAEA on all outstanding issues, particularly those which gave rise to concerns about the possible military dimensions of the Iranian nuclear programme, including by providing access without delay to

[5] In paragraph 13 of resolution 1929 (2010), the Security Council updates the provisions of earlier resolutions with regard to INFCIRC/254/Rev.9/Part 1 and INFCIRC/254/Rev.7/Part 2. The resolution states that, for the purposes of the measures specified in paragraphs 3 to 7 of resolution 1737 (2006), the list of items in document S/2006/814 shall be superseded by the list of items in INFCIRC/254/Rev.9/Part 1 and INFCIRC/254/Rev.7/Part 2.

all sites, equipment, persons and documents requested by IAEA. It further required that the Islamic Republic of Iran should comply with the application of the modified Code 3.1 of the subsidiary arrangement to its safeguards agreement, and act in accordance with the provisions of the Additional Protocol to its safeguards agreement. The Council called upon the Islamic Republic of Iran to ratify the Additional Protocol, and reaffirmed that the safeguards agreement and its subsidiary arrangement could not be amended or changed unilaterally by the Islamic Republic of Iran.

2. Background

45. The continuing refusal of the Islamic Republic of Iran to suspend enrichment and heavy water-related activities and to cooperate fully with IAEA in resolving outstanding questions, in particular those related to research and development activities with potential military applications dimensions, has been comprehensively documented by IAEA (see GOV/2011/65 and GOV/2011/7, among others). In brief, these allegations are described as coming from a wide variety of independent sources, including from a number of Member States, from the Agency's own efforts and from information provided by the Islamic Republic of Iran itself. The information is consistent in terms of technical content, individuals and organizations involved, and time frames. IAEA notes further that information that it obtained regarding such activities indicates that the Islamic Republic of Iran has carried out the following activities that are relevant to the development of a nuclear explosive device:

(a) Efforts, some successful, to procure nuclear-related and dual-use equipment and materials by military-related individuals and entities;

(b) Efforts to develop undeclared pathways for the production of nuclear material;

(c) The acquisition of nuclear weapons development information and documentation from a clandestine nuclear supply network;

(d) Work on the development of an indigenous design of a nuclear weapon including the testing of components (GOV/2011/65, paras. 42 and 43).

46. The Panel's objective in the present section is to examine the impact of sanctions on the ability of the Islamic Republic of Iran to maintain and expand its uranium enrichment activities. It addresses specific challenges, in particular with regard to Iranian efforts to procure items necessary for its nuclear programme, which cannot be produced indigenously in sufficient quantities or quality to sustain some Iranian nuclear activities.

3. Analysis

(a) Uranium ore production

47. The Islamic Republic of Iran is believed by a number of Member States to be seeking new sources of uranium ore to supply its enrichment efforts, even as efforts are under way to develop further its indigenous production of uranium ore. The country is prohibited from importing uranium ore under paragraph 13 of resolution 1929 (2010).

Uranium mining and processing in the Islamic Republic of Iran

48. The status of indigenous uranium mining activity in the Islamic Republic of Iran remains opaque. The country has declared to IAEA two uranium mines: one, Saghand, located in Yazd Province in the centre of the country, and the other, Gchine, in the south, near Bandar Abbas. Only the Gchine mine is currently operating. The country is constructing a yellowcake production plant in Ardakan, which will eventually process the ore from the Saghand mine into uranium ore concentrate. Both the Saghand mine and Ardakan facility are designed to have the capacity to process 50 tons of uranium annually. The Gchine mine also has a co-located yellowcake production plant with a reported annual processing capacity of 21 tons of uranium. The combined output of these mines is inadequate for the fuelling of a single 1,000 MW reactor, which on average requires approximately 25 tons of low-enriched uranium per year or the equivalent of at least 220 tons of natural uranium.[6]

49. These facilities are not subject to IAEA safeguards inspections, although activity at the sites can be monitored by satellite imagery. Imagery analysis indicates that the Gchine mine and co-located yellowcake production plant are operational. Annex III to the present report contains images of these facilities marking their changes over recent years.

Current stocks and level of consumption of uranium ore

50. To understand the future requirements of the Islamic Republic of Iran in terms of uranium ore, it is useful to understand its current stocks and level of consumption. The country has produced 371 tons of uranium hexafluoride since beginning operation of its uranium conversion facility in Esfahan in March 2004. According to IAEA, this uranium hexafluoride was converted from a store of approximately 530 tons of uranium ore concentrate acquired by the Islamic Republic of Iran in the early 1980s (GOV/2004/83). No uranium hexafluoride has been produced at the Esfahan facility since 10 August 2009, according to IAEA (GOV/2010/62, para. 24).

51. As at October 2011, the Islamic Republic of Iran had introduced almost 55.7 tons of uranium hexafluoride into its centrifuges since enrichment began in February 2007, amounting to some 15 per cent of its stockpile (GOV/2012/9, para. 14). The country therefore has an ample supply of uranium hexafluoride to maintain current levels of enrichment for the foreseeable future.

52. The Islamic Republic of Iran is, however, likely to require additional sources of uranium if enrichment is to expand along the lines that it has described.[7] It will

[6] A 1,000 MW reactor requires approximately 25 tons of low-enriched uranium annually to maintain regular operation. Although at least 220 tons of natural uranium would be required to produce 25 tons of 4 per cent low-enriched uranium, this number can be considerably higher if the enrichment process produces a high quantity of enriched uranium in what are known as the "tails", as appears to be the case in the Iranian enrichment operations.

[7] "Iran produces fuel for 20 power plants under construction, MP", *IRNA*, 14 August 2010, and "Iran to increase centrifuges to 50,000: Aqazadeh", *IRNA*, 25 February 2009. In addition, according to IAEA reports, the Islamic Republic of Iran maintains two cascade halls at the Natanz fuel enrichment plant. One, for which design information has been submitted, contains eight units, each to contain 18 cascades. Cascades have typically consisted of 164 centrifuges. Once completed, Cascade Hall A would consist of approximately 23,600 centrifuges. No detailed design information has yet been provided for Production Hall B (see GOV/2011/65, para. 8).

also eventually require additional stocks of natural uranium for the Arak heavy water reactor. Member States have informed the Panel that emerging suppliers are potential targets for attempted acquisition by the Islamic Republic of Iran. Although the Panel is not aware of any confirmed cases of actual transfers, it has sought consultations with a number of Member States regarding reported agreements with the country for the supply of uranium ore.

Other sources of uranium ore concentrate

53. While the Islamic Republic of Iran has experimented with the extraction of uranium from phosphates, which are commonly used in fertilizers, the Panel has no evidence that it has gone beyond laboratory-scale research into this area (GOV/2004/83, para. 5).

(b) Procurement related to uranium enrichment

54. Sanctions targeting Iranian procurement of critical components for the country's gas centrifuge programme notwithstanding, it has succeeded in manufacturing, installing and operating more than 9,500 IR-1 centrifuges since February 2007, when installation and operation of centrifuges at the Natanz fuel enrichment plant began (GOV/2012/9, paras. 11-26). This figure includes 8,828 IR-1 centrifuges operating at the Natanz fuel enrichment plant, 328 at the pilot fuel enrichment plant and 348 at the Fordow fuel enrichment plant. An additional 6,177 empty centrifuge casings have been placed at the Natanz fuel enrichment plant, and 2,088 at the Fordow facility. The IR-1 centrifuges, however, have a well-documented, limited capacity for enrichment and the Islamic Republic of Iran has been eager to develop a more advanced enrichment capacity.[8] Although the Iranian enrichment programme has experienced a measure of success using IR-1 or first-generation centrifuges, its ability to advance its enrichment efforts has encountered difficulties, some of which may be the result of sanctions limiting its ability to procure items necessary for its centrifuge programme.

Reports of attempted procurement

55. During its current mandate, the Panel received information from several Member States regarding goods and materials that the Islamic Republic of Iran sought to procure for its nuclear programme. Examples included:

(a) Nuclear-grade graphite;

(b) High-strength aluminium;

(c) Aluminium powder;

(d) Specialized alloys (such as chrome and nickel);

(e) Maraging steel;

(f) Carbon fibre;

(g) Lubricants;

[8] David Albright and others, "Preventing Iran from Getting Nuclear Weapons; Constraining its Future Nuclear Options", *Institute for Science and International Security*, March 2012, pp. 12-13. Available from http://isis-online.org/uploads/isis-reports/documents/USIP_Template_5March2012-1.pdf.

(h) Magnets;

(i) Control valves;

(j) Heat exchangers;

(k) Pressure transducers;

(l) Vacuum pumps;

(m) Gauges;

(n) Inverters;

(o) Turbines;

(p) Electrical switchboards;

(q) Helium gas detectors;

(r) Sodium perchlorate.

56. One Member State provided the Panel with detailed information regarding Iranian attempts to procure items for sanctioned nuclear facilities through intermediaries linked to the Iranian nuclear programme, although not necessarily limited to the centrifuge programme. These included high-frequency converters, electrical switchboards and related equipment needed for the operation of the Iranian nuclear facilities. Other items identified by the Member State as sought by the Islamic Republic of Iran in specific cases included detection equipment for helium gas leaks, gauges, specialized valves and aluminium tubes and sheets.

(c) Role of carbon fibre in gas centrifuges

57. A number of Member States shared information on the role of carbon fibre in the Iranian nuclear programme and as a target for procurement. The Panel explores this issue below in greater detail. This analysis in no way suggests that the items described above merit less vigilance by Member States with regard to procurement.

58. Carbon fibre has many properties that make it ideal for use in gas centrifuges: it is stronger and lighter than aluminium, corrosion resistant and especially high in tensile strength and modulus, or stiffness. Carbon fibre will resist distortion under high centrifugal forces.[9] Among the highest grades of carbon fibre, and those that are best suited for use in centrifuge rotors and bellows (a cylindrical-shaped connector between two segments of rotor tubes), are fibres designated as ultra-high strength or intermediate modulus fibres.

[9] Carbon fibres are extremely thin in diameter, a fraction of the size of a human hair. They are typically wound together to form a type of "tow" (or strand), which is then moulded with resins to form carbon fibre composites. Carbon fibre is classified according to the tensile modulus of the fibre, measured in pounds of force per square inch (on the vertical axis) and its modulus or stiffness (on the horizontal axis). Carbon fibre has applications in numerous industries, including aerospace, automotive and high-end sporting goods. The Nuclear Suppliers Group controls all carbon fibre with a modulus greater than 12.7 and tensile strength greater than 23.5. See annex VII to the present report for more details.

Carbon fibre components in Iranian centrifuges

59. The rotors of the Iranian IR-1 centrifuges are manufactured with aluminium 7075.[10] The Islamic Republic of Iran also requires maraging steel for the IR-1 bellows. The table in annex IV to the present report, taken from a nuclear engineering textbook, illustrates the limitations of aluminium relative to carbon fibre in centrifuges.

60. The Islamic Republic of Iran has experimented with several models of post-IR-1 centrifuges, in particular the IR-2m and IR-4, both of which require carbon fibre rotors. In addition to those models, the Islamic Republic of Iran informed IAEA in a letter dated 1 February 2012 that it intended to develop additional models, including the IR-5, 6 and 6s (GOV/2012/9, para. 20).

61. The Iranian IR-4 centrifuge is believed by experts to be manufactured with a carbon fibre rotor and a carbon fibre bellows (see figure I). The IR-2m is believed to be made with a carbon fibre rotor and maraging steel bellows. Both the IR-2m and IR-4 centrifuges are the same height and assessed to have similar enrichment capacity.

Figure I
Carbon fibre centrifuge components

Source: Office of the President of the Islamic Republic of Iran.

62. It is important to note that the development by the Islamic Republic of Iran of its next-generation centrifuges dates to an early stage of its overall gas centrifuge programme. According to IAEA, the country acquired design documents for the P-2 from a clandestine supply network in 1994 (GOV/2004/83, para. 23). Its decision to develop carbon fibre components appears to date to 2002 when a subcontractor

[10] One of the limitations of aluminium 7075 for centrifuge enrichment is its maximum speed of approximately 350 metres per second. This, along with other design limitations in the IR-1, may be a factor in the machine's relatively high failure rate. Centrifuges made from carbon fibre can achieve much higher speeds depending on the quality of the material and other potentially limiting factors (see Manson Benedict and others, *Nuclear Chemical Engineering*, 2nd ed. (New York, McGraw-Hill, 1981), p. 855).

decided that, since in his view the Islamic Republic of Iran was not capable of manufacturing maraging steel cylinders with bellows, work should proceed with a shorter, sub-critical carbon composite rotor (GOV/2004/83, para. 44).

63. The figures in annex V to the present report illustrate the relatively slow development of the Iranian next-generation centrifuges, especially when compared to the far more rapid pace of installation for the IR-1 centrifuge. In 2008, the very first IR-2 centrifuges were installed at the Natanz pilot fuel enrichment plant. That model was phased out in 2009 in favour of the IR-2m and IR-4. Although installation of the IR-2m recently increased, installation of the IR-4 remains at a relatively low level. This may indicate difficulties with the operation of a centrifuge containing two critical components made from carbon fibre (as noted above, the IR-2m centrifuge is made using a carbon fibre rotor and maraging steel bellows). Other variables, including design and manufacturing limitations, or a shortage of other necessary materials, may also explain delays in the deployment of advanced centrifuges.

Indigenous production

64. The Panel's analysis of the deployment by the Islamic Republic of Iran of centrifuges to date, in addition to discussions with experts and Member States, indicates that the country lacks the technology and equipment to produce high-grade carbon fibre indigenously. The Panel's analysis is described in more detail in annex VI to the present report. In brief, the carbon fibre produced in an Iranian facility, which can be viewed in an online video clip, is not assessed by experts in carbon fibre production and manufacturing to be suitable for use in Iranian centrifuges. The country is therefore likely to continue to rely on foreign procurement to support its next-generation centrifuge development efforts.

Procurement of carbon fibre from abroad

65. One report received by the Panel from a regional multilateral organization highlighted the continued interest of the Islamic Republic of Iran in the procurement of high-grade carbon fibre. According to another Member State, the Islamic Republic of Iran is continuing its attempts to procure high-grade carbon fibre necessary for the development of its more advanced centrifuges. This State had knowledge of an attempted procurement of two tons of high-grade carbon fibre. The Panel is also aware of one incident of carbon fibre interdicted by a Member State en route to the Islamic Republic of Iran in the past year. The Panel has no information regarding the potential use of this material in prohibited nuclear activities, or its technical specifications, and is in contact with the State to obtain additional information.

66. The Panel has also seen high-grade carbon fibre made available for sale on Internet trading platforms. In the report referenced in paragraph 65, the accessibility of such fibre was highlighted and it was noted that such websites were likely to be used by Iranian procurers to contact prospective intermediaries to procure carbon fibre supplies. Experts familiar with developments in the industry observe that the significant growth in demand in recent years for higher grades of carbon fibre, brought on in part by expansion in the aerospace and automotive sectors, has led to surpluses in the supply chain. Some Member States that the Panel consulted described outreach programmes to industry to ensure that surplus carbon fibre did not find its way into a secondary market for possible procurement by the Islamic Republic of Iran.

Ensuring control of carbon fibre under existing sanctions

67. The Harmonized Commodity Description and Coding System maintained by the World Customs Organization provides an internationally recognized and standardized system for classifying goods. The Panel notes that the classification number 681510 does not distinguish carbon fibres of different specifications. This raises the question of whether carbon fibre falling at or above thresholds established by export control regimes could be assigned a different number or whether an alternative categorization system could be applied.

(d) Implementation of sanctions and procurement relevant to a nuclear explosive device

68. The Panel takes note of information reported by IAEA regarding procurement and attempted procurement by the Islamic Republic of Iran of equipment, materials and services that, although having other civilian applications, would be useful in the development of a nuclear explosive device. These include high-speed electronic switches and spark gaps (useful for triggering and firing detonators); high-speed cameras (useful in experimental diagnostics); neutron sources (useful for calibrating neutron-measuring equipment); radiation detection and measuring equipment (useful in a nuclear material production environment); and training courses on topics relevant to nuclear explosives development (such as neutron cross-section calculations and shock wave interactions/hydrodynamics) (GOV/2011/65, annex, paras. 25 and 26). No incidents of such procurement or training courses were reported to the Panel during its mandate.

4. Conclusions

69. On the basis of the Panel's consultations with Member States, outside experts and analysis of IAEA findings, the Panel continues to find evidence to suggest that sanctions are slowing the ability of the Islamic Republic of Iran to expand some aspects of its fuel cycle activities.

70. The country's reported current and projected domestic production of uranium ore is insufficient to support the fuel requirements of a nuclear power programme. Although the existing Iranian stockpile of uranium hexafluoride is adequate for its current level of enrichment activity, this may change with expanded enrichment, as envisaged by the country, or with the completion of a reactor using natural uranium as fuel.

71. Member States, in particular those with significant phosphate exports, should be alert to the potential risk of diversion of such exports should the Islamic Republic of Iran decide to develop further its resources in this area.

72. While no reports were received by the Panel of interdictions of dual-use items for use in a nuclear programme with military dimensions, vigilance by Member States to guard against possible procurement of such items by the Islamic Republic of Iran continues to be important.

B. Ballistic missiles

1. Introduction

73. In paragraph 9 of resolution 1929 (2010), the Security Council decided that the Islamic Republic of Iran was not to undertake any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile technology, and that Member States were to take all measures necessary to prevent the transfer of technology or technical assistance to the Islamic Republic of Iran related to such activities. In paragraph 7 of that resolution, the Council decided that the Islamic Republic of Iran was not to acquire an interest in any commercial activity in another State involving, among other things, technology related to ballistic missiles capable of delivering nuclear weapons.

74. Pursuant to paragraph 3 of resolution 1737 (2006), Member States are obliged to take the necessary measures to prevent the supply, sale or transfer directly or indirectly of all items, materials, equipment, goods and technology, referred to in document S/2006/815 that could contribute to the Islamic Republic of Iran's development of nuclear weapon delivery systems. In paragraph 13 of resolution 1929 (2010), the Security Council decided that the list of items contained in document S/2006/815 was to be superseded by the list of items contained in document S/2010/263.

75. In the present section, the Panel provides a brief summary of recent developments related to ballistic missile activity over the past year. These include information reported by IAEA regarding the potential military dimensions of the Iranian nuclear programme, including a nuclear payload for a missile, a series of test launches of ballistic missiles, the introduction of the Qiam missile, the disclosure of missile silos and the launch by the Islamic Republic of Iran of two satellites using the Safir space launch vehicle. The Panel also addresses information provided by Member States concerning continuing procurement efforts related to ballistic missiles.

2. Background

76. The Iranian arsenal of ballistic missiles is widely recognized as one of the largest in the region. The table in annex VIII to the present report provides an overview of the number and type of ballistic missiles. Two in particular are judged to be potentially nuclear capable: the liquid propelled Shahab-3 and the solid-fuel-propelled Sejil (also referred to as the Sajjil or the Ashura). The Islamic Republic of Iran is not judged to have an operational intercontinental ballistic missile.

77. While the Islamic Republic of Iran is actively producing its own missiles, it remains reliant on foreign suppliers for components, materials and equipment. According to some experts, there is no evidence that the Islamic Republic of Iran possesses the technology necessary to manufacture the large-diameter, flow-formed pressure tanks and large, composite pressure vessels necessary to construct larger, long-range missiles. It also appears that the Islamic Republic of Iran continues to import whole engines, or at least critical engine components, for its liquid-fuelled missiles, and requires components for guidance systems.[11]

[11] Miles A. Pomper and Cole J. Harvey, "Beyond missile defense: alternative means to address Iran's ballistic missile threat", *Arms Control Today*, October 2010, citing "Iran's Ballistic Missile Capabilities: A Net Assessment", *International Institute for Strategic Studies*, 7 May 2010.

78. In November 2011, IAEA stated that, since 2002, it had become increasingly concerned about the possible existence in the Islamic Republic of Iran of undisclosed nuclear-related activities involving military-related organizations, including activities related to the development of a nuclear payload for a missile, about which it had regularly received new information (see GOV/2011/65, para. 38, and previous reports).

79. IAEA describes work that took place before 2004 as a structured and comprehensive programme of engineering studies to examine how to integrate a new spherical payload into the existing payload chamber which would be mounted in the re-entry vehicle of the Shahab-3 missile. In addition, according to documentation provided by a Member State, the Islamic Republic of Iran conducted computer modelling studies of at least 14 progressive design iterations of the payload chamber and its contents to examine how they would stand up to the various stresses that would be encountered on being launched and travelling on a ballistic trajectory to a target (GOV/2011/65, annex, paras. 59 and 60).

80. IAEA has described the information on which its assessments are based as coming from a wide variety of independent sources, including from a number of Member States, from its own efforts and from information provided by the Islamic Republic of Iran itself (GOV/2011/65, para. 42).

3. Recent developments

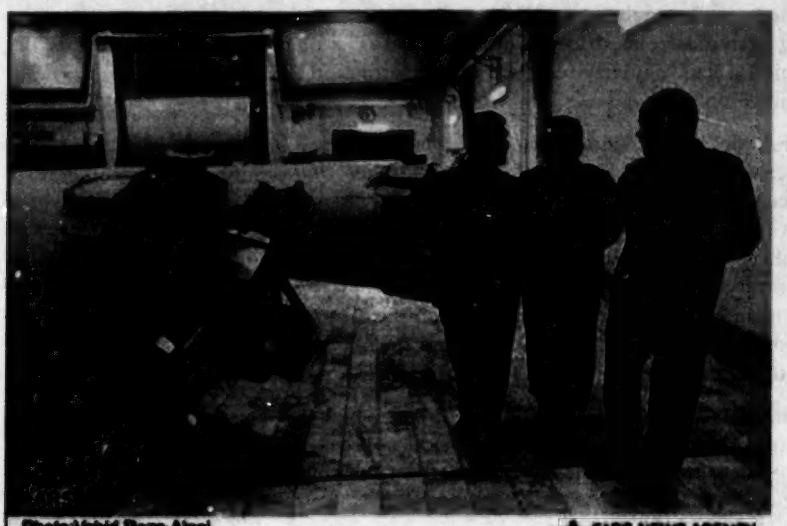
81. **Missile launches**. In late June 2011, the Islamic Republic of Iran held a military exercise known as "Great Prophet Six". On 28 June 2011, the commander of the Islamic Revolutionary Guards Corps Aerospace Force, Amir Ali Hajizadeh, announced on Iranian State television that, on the second day of the exercise, the country had fired Zelzal rockets, the Shahab-1 and -2 and the Ghadr (a modified version of the Shahab-3 medium-range ballistic missile).[12]

82. **Qiam missile**. The only test of this missile reported in the media took place in August 2010. The Iranian Minister of Defence, Ahmad Vahidi, highlighted the missile's lack of stabilizer fins, which he claimed would increase the missile's speed and allow it to be launched from a silo.[13] He also claimed that the liquid-fuelled ballistic missile was entirely indigenously produced. In May 2011, he announced the delivery of the missile to the Islamic Revolutionary Guards Corps (see figure II). One Member State assessed the Qiam to be based on the Shahab-2, with a range of between 500 and 1,000 km. Some experts have raised questions about the missile's lack of apparent testing. Missiles are known to require extensive flight-test programmes before they can be fully operational.

[12] Farhad Pouladi, "Iran fires medium range missile in war game", Agence France Presse, 28 June 2011. Jonathan's Space Report No. 643, 5 July 2011, SpaceRef International Group. Available from www.spaceref.com/news/viewsr.html?pid=37608.

[13] "New ballistic missile delivered to IRGC", *Day.AZ*, 23 May 2011.

Figure II
Qiam missile



83. **Underground silos**. On 27 June 2011, as part of the "Great Prophet Six" exercises, the Islamic Revolutionary Guards Corps also unveiled an underground missile silo from which ballistic missiles would be able to be launched. The Iranian spokesperson for the exercises, Asghar Ghelichkhani, claimed that the technology for building the silos was completely indigenous.[14] Iranian officials have been quoted publicly claiming that the silos provide a swift reaction unit and the ability to confront unequal enemies and defend the Islamic Republic of Iran.[14] The Iranian missile silos, which have been reported for a number of years, are not confirmed to be operational.

(a) Reported satellite launch

84. Over the course of the Panel's current mandate, the Islamic Republic of Iran launched two satellites: the Rasad-1, on 15 June 2011, and the Navid, on 3 February 2012. These launches followed its first successful launch of a satellite, the Omid, in February 2009. Both launches were reported to the Committee by France, Germany, the United Kingdom and the United States; the first in a communication dated 15 July 2011 and the second on 28 February 2012.

85. On the basis of those reports to the Committee, the Panel investigated the Rasad-1 launch and reported to the Committee on 6 November 2011. On the basis of the provisions of paragraph 9 of resolution 1929 (2010), the Panel sought to ascertain whether the launch could be considered an activity related to ballistic missiles capable of delivering nuclear weapons, and whether the launch was using ballistic missile technology.

[14] William Broad, "Iran unveils missile silos as it begins war games", *New York Times*, 27 June 2011.

86. According to information shared with the Panel and widely circulated photographic images of the launch vehicle published by Iranian news agencies, the satellite was launched by a two-stage liquid-fuelled Safir launch vehicle.[15] The two engines in the upper stage of the Safir are assessed by Member States and experts consulted by the Panel to most closely resemble the vernier engines found on the R-27 submarine-launched ballistic missile, also known as the SS-N-6. These provide low thrust to the second stage, and their steerable nozzles allow adjustments to the flight path through thrust vector controls (see figure III).

87. The Panel reached a consensus that both ballistic missile and space launch programmes shared a great deal of similar materials and technology, including systems for propulsion, control and navigation. The Panel also noted that, although some examples existed of ballistic missiles programmes developed from space launch programmes, in general there were more examples of the reverse — space launch programmes developed on the basis of ballistic missile programmes.

88. The Panel agreed that the Safir space launch vehicle was not designed to carry nuclear weapons.

89. Five members of the Panel concluded that the launch was clearly related to missiles capable of delivering such weapons based on their established relationship to two nuclear-capable ballistic missiles. Three members of the Panel concluded that the launch of the Rasad-1 was not an activity related to ballistic missiles capable of delivering nuclear weapons. With regard to the question of whether the launch was using ballistic missile technology, six members of the Panel concluded that the launch did use such technology, while two members believed that it was difficult to reach such a firm conclusion.

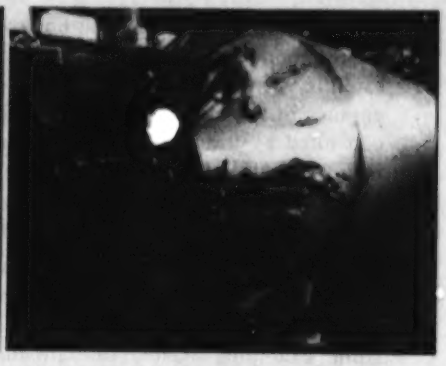
Figure III
Safir space launch vehicle and the Shahab-3

Safir space launch vehicle first stage

Shahab-3 medium-range ballistic missile

[15] The Safir reportedly has a length of 22 m, a core diameter of 1.25 m and a launch weight of 26,000 kg. The first stage of the Safir is derived from the Ghadr-1 missile, a variant of the Shahab-3 medium-range ballistic missile. It is believed to be 13.5 m long, with a mass of 18,000 kg. The Safir's second stage is estimated to be 8.5 m in length with a mass of 8,000 kg.

Safir second stage



Safir second stage
(vernier engines more visible)

90. The Navid satellite launch was not the subject of a separate investigation by the Panel. It was reported to weigh approximately 50 kg and was reportedly built by Iranian students at the Sharif University of Technology as a weather satellite, which would remain in orbit for 18 months. It was launched by a modified Safir space launch vehicle, including a modified Shahab-3 ballistic missile comprising the first stage.[16]

(b) Procurement related to ballistic missiles

91. The Panel received no reports of alleged procurement attempts related to ballistic missiles during its current mandate. A number of Member States, however, shared information concerning procurement priorities and items meriting extra vigilance. Among those were production equipment for missile purposes (including metal processing machines), precise inertial gauges, testing equipment (including vibration testing equipment), fuel-related material (aluminium powder), valves, turbines and frequency converters. Gyroscopes and related technology for guidance systems were also highlighted as one of the procurement priorities of the Islamic Republic of Iran and for which it was especially dependent on foreign suppliers.

92. One Member State informed the Panel that it was implementing sanctions by working to strengthen controls over various types of steel and construction material that could be used for manufacturing nuclear-capable ballistic missiles. A special commission had been established to evaluate specific types of steel that could be used in the production of ballistic missiles and thereby contribute to proliferation risks.

93. The Panel notes the designations announced on 2 May 2012 of two Democratic People's Republic of Korea entities, the Korea Heungjin Trading Company (which the Committee suspects has been involved in supplying missile-related goods to the Shahid Hemmat Industrial Group of the Islamic Republic of Iran) and Amroggang Development Banking Corporation (which has been involved in ballistic missile transactions from the Korea Mining Development Trading Corporation to the Shahid Hemmat Industrial Group) (S/2012/287). The Security Council designated the

[16] Stephen Clark, "Observing satellite launched by modified Iranian missile", *Spaceflight Now*, 3 February 2012.

Shahid Hemmat Industrial Group in resolution 1737 (2006) as an entity involved in the Iranian ballistic missile programme.

94. According to a report by Yonhap News Agency, a delegation of 12 Iranian officials from the Shahid Hemmat Industrial Group travelled to the Democratic People's Republic of Korea to observe the 13 April launch.[17]

4. Conclusions

95. With the exception of the Rasad and Navid satellite launches, the Panel received no reports of alleged violations related to ballistic missile launches.

96. Its growing manufacturing and technical competence notwithstanding, the Islamic Republic of Iran continues its attempts to procure essential technology and components. Preventing the supply of crucial missile components is an important aspect of successful implementation of sanctions.

C. Conventional arms and related materiel

1. Introduction

97. In paragraph 5 of resolution 1747 (2007), the Security Council decided that the Islamic Republic of Iran was not to supply, sell or transfer directly or indirectly from its territory or by its nationals or using its flag vessels or aircraft any arms or related materiel, and that all Member States were to prohibit the procurement of such items from the Islamic Republic of Iran by their nationals, or using their flag vessels or aircraft, and whether or not originating in the territory of the Islamic Republic of Iran.

98. Member States are required under paragraph 8 of resolution 1929 (2010) to prevent the direct or indirect supply, sale or transfer to the Islamic Republic of Iran any battle tanks, armoured combat vehicles, large-calibre artillery systems, combat aircraft, attack helicopters, warships, missiles or missile systems as defined for the purpose of the United Nations Register of Conventional Arms, or related materiel, including spare parts, or items as determined by the Security Council or the Committee. Member States are to prevent the provision to the Islamic Republic of Iran of relevant training and financing, and are called upon to exercise vigilance and restraint over the supply of all arms and related materiel.

99. In the present section, the Panel provides its analysis on the basis of three inspections of reported incidents of conventional arms interdictions and emerging connections among these and previous reported interdictions investigated by the Panel with the aim of identifying trends in the illegal transfer of conventional arms by the Islamic Republic of Iran.

2. Recent inspections

100. During its current mandate, the Panel inspected three reported incidents of non-compliance as reported by Member States to the Committee and submitted reports as required.

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[17] Danielle Demetriou, "Iranian officials 'observed North Korean rocket launch'", *Telegraph*, 16 April 2012.

101. The Panel notes the continuation of a trend reported previously in which most of the incidents referred to the Panel for inspection involved conventional arms and related materiel. The table in annex IX to the present report contains a complete accounting of the arms and related materiel inspected by the Panel, in addition to information derived from documents, in particular shipment consignor and consignee information. These inspections are summarized below.

(a) Yas Air (Turkey)

102. On 19 March 2011, the Turkish authorities seized 19 crates containing assault rifles, machine guns, ammunition and mortar shells from an Ilyushin cargo aircraft operated by the cargo airline Yas Air (formerly known as Pars Aviation Services Company, as described in para. 231). It was found to be carrying 60 AK-47 assault rifles, 14 BKC/Bixi machine guns, 560 60-mm mortar shells and 1,288 120-mm mortar shells from the Islamic Republic of Iran to the Syrian Arab Republic.

103. In a 19 November 2011 inspection, the Panel examined and confirmed the arms and ammunition as inventoried by the Turkish authorities, in addition to documents provided establishing the origin and destination of the shipment. The Panel concluded that that shipment constituted a violation by the Islamic Republic of Iran of paragraph 5 of resolution 1747 (2007).

(b) Kilis (Turkey)

104. On 15 February 2011, the Turkish authorities seized a truck carrying explosives originating in the Islamic Republic of Iran en route to the Syrian Arab Republic. The interdiction took place at Turkey's border with the Syrian Arab Republic. The contents of the truck were clearly described on shipping documents and are summarized as follows:

(a) Two boxes of gunpowder M9, for a total weight of 890 kg;

(b) Two boxes of propelling charge;

(c) Two boxes of slow-burning material, for a total weight of 40 kg;

(d) One box of sensitive materials (detonators);

(e) Six pallets of solid rockets;

(f) Two pallets of RDX explosives for a total weight of 1,700 kg.

105. The Panel inspected the items and found them to be materials for military purposes, while noting that the detonators and RDX explosive had both military and non-military applications. Documents examined by the Panel, including an invoice issued by the consignor of the shipment, SAD Import Export Company, and the TIR carnet, further established the nature, origin and destination of the cargo.

106. Parchin Chemical Industries and 7th of Tir Industries, both entities designated by United Nations sanctions as subordinates of the Iranian Defence Industries Organization, were identified in documents found with the shipment. The contract referenced in the invoice had been concluded in 2006 for a series of 20 shipments. The Panel concluded that that shipment constituted a violation by the Islamic Republic of Iran of paragraph 5 of resolution 1747 (2007).

(c) International Security Assistance Force (Afghanistan)

107. The United Kingdom authorities reported on 21 April 2011 a seizure by the International Security Assistance Force on 5 February 2011 of a shipment of rockets and ammunition near Afghanistan's border with Pakistan. The shipment was reported to include 48 122-mm rockets, 49 fuses and 1,000 7.62-mm ammunition rounds.

108. Following the seizure, much of the shipment was destroyed in situ and the rest transferred to the United Kingdom for forensic analysis to provide additional evidence of its origin. Tests included X-ray examination, metallurgy sampling, and chemical and comparative analysis. The United Kingdom also possessed intelligence suggesting that the shipment of rockets originated in the Islamic Republic of Iran. Many of the characteristics of the rockets matched Iranian rockets found elsewhere.

109. The Panel inspected some of the remains of the rockets in the United Kingdom on 26 September 2011. The Panel carried out its investigation on the basis of evidence provided by the United Kingdom authorities, independent research and consultations with experts.

110. The Panel concluded that there was a high probability that the rockets had originated in the Islamic Republic of Iran. The Panel invited relevant Member States to provide further evidence that would enable confirmation of that finding, and consulted experts from the North Atlantic Treaty Organization in Brussels in search of relevant evidence. The Panel continues its investigation and seeks further information.

3. Analysis

Nature of the transfers

111. Whereas in previous inspections the Panel had found only ammunition and no arms, the current cases include a greater diversity of items. In the Yas Air case, arms and ammunitions were both present; in the Kilis case, detonators and explosives were identified. The Panel also observed that, previously, systematic attempts had been made to conceal shipments physically through erased markings or packaging, but the current cases reflected no such attempts. This may reflect confidence on the part of the Islamic Republic of Iran that the transfers might proceed undetected, a greater time pressure for the shipments or operational errors on the part of the Iranian authorities.

Transportation

112. Although the current cases inspected by the Panel include examples of arms transfers using ground and air transport, it cannot be excluded that the Islamic Republic of Iran continues to use maritime avenues to transport shipments of arms and related materiel. This issue is discussed further in paragraphs 150 to 181. One Member State alerted the Panel that the Islamic Republic of Iran might be using mixed passenger-cargo flights to transfer arms illicitly. The Panel has not further corroborated this information.

Iranian origin of items

113. The Panel found documentary evidence in two of the three cases linking the shipments to the Islamic Republic of Iran as the sender. Documents found with the

shipment of high explosives (Kilis case) connect the items to Parchin Chemical Industries and 7th of Tir Industries. Both are subsidiaries of the Iranian Defence Industries Organization and all three entities are designated under Security Council resolutions: the Defence Industries Organization and 7th of Tir Industries are designated under annex I to resolution 1737 (2006), while Parchin Chemical Industries is designated under annex I to resolution 1747 (2007). The Yas Air case raises the issue of an existing designation under a previous name and the need for a new designation based on the interdiction. This matter is discussed further in paragraph 231.

Syrian destination of items

114. The Panel found documentary evidence in two of the three cases linking the shipments to the Syrian Arab Republic as the recipient. The shipments contained information pointing to specific consignees in the country for a series of 20 shipments dating from 2006, including a commercial invoice with a reference to the Central Bank in the letter of credit.

Common elements among interdictions

115. The Panel has identified connections linking current and previous interdictions. The Panel notes that the labels on wooden boxes containing mortar shells found in the Francop (Israel) case appeared identical to those found in the Yas Air (Turkey) interdiction. In both cases, the label read "Ministry of Sepah", while in the Yas Air case, a crude attempt had been made to cross off the word "Sepah".

116. The Panel also identified connections between the recent Kilis (Turkey) case and two earlier cases: the *M/V Monchegorsk* (Cyprus) and *Hansa India* (Malta) interdictions. The consignor and consignee in both the Kilis and *M/V Monchegorsk* cases were identical, and both shipments included increment charges for 120-mm mortar shells and black powder. The invoice issued by the consignor of the shipment seized in the Kilis (Turkey) case, SAD Import Export Company, indicates that the consignment was related to prior maritime shipments to "Lattakia or Tartous Ports". Some of the contents of the *M/V Monchegorsk* shipment, as described in a letter to the Committee dated 3 February 2009, appeared to be identical to those found in the *Hansa India* interdiction, including bronze brass plates and bullet casings packed in blue metallic barrels. Papers found on the blue metallic barrels on the *Hansa India* identified Lattakia or Tartous ports as destinations.

Additional information from Member States

117. Alleged arms transfers from the Islamic Republic of Iran to Member States have been reported in the media.[18] One Member State reported that in 2011 the Islamic Republic of Iran delivered military equipment and spare parts to the Sudan, in addition to providing military technical assistance. Another Member State informed the Panel of arms transfers to Yemen. The Panel is following up, as appropriate, to encourage the necessary reporting to the Committee. The Panel stands ready to receive from Member States additional information regarding these reported transfers.

[18] Eric Schmitt and Robert Worth, "With arms for Yemen rebels, Iran seeks wider Mideast role", *New York Times*, 15 March 2012.

4. Conclusions

118. During the Panel's current mandate, there were no violations involving transfers of conventional arms and related materiel to the Islamic Republic of Iran reported to the Committee.

119. Inspections indicate that the Islamic Republic of Iran continues to transfer arms, ammunition and dual-use items necessary for the production of explosive ordnance. Such transfers occur by all available means of transportation: air, land and sea.

120. The Syrian Arab Republic continues to be the central party to illicit Iranian arms transfers, as demonstrated by the two additional cases inspected by the Panel to date.

D. Export control

1. Introduction

121. In resolution 1737 (2006), the Security Council decided that all States were to take the necessary measures to prevent the supply, sale or transfer of all items, materials, equipment, goods and technology (listed in documents S/2006/814 and S/2006/815) that could contribute to the Islamic Republic of Iran's enrichment-related, reprocessing or heavy water-related activities, or to the development of nuclear weapon delivery systems. In resolution 1929 (2010), the Council decided that the list of items in document S/2006/814 was to be superseded by the list of items in INFCIRC/254/Rev.9/Part 1 and INFCIRC/254/Rev.7/Part 2, and the list of items contained in document S/2006/815 by the list of items contained in document S/2010/263.

122. In resolution 1737 (2006), the Council decided that States were to take measures to prevent the provision to the Islamic Republic of Iran of any technical assistance or training, and called upon all States to exercise vigilance and prevent specialized teaching or training of disciplines which would contribute to the Islamic Republic of Iran's proliferation-sensitive nuclear activities and to the development of nuclear weapon delivery systems.

123. In the present section, the Panel addresses the role played by export controls in preventing procurement by both Government authorities and the private sector of the items described above. It also describes some challenges and makes conclusions.

2. Analysis

124. Many Member States attach great importance to implementing their Security Council obligations concerning the Islamic Republic of Iran in the area of export controls. At the same time, the continuing prohibited nuclear and ballistic missile procurement efforts by the Islamic Republic of Iran pose challenges for all Member States, in particular those with less-developed export control systems, in terms of identifying dual-use items and implementing catch-all provisions.

(a) Implementation measures by Governments

125. Member States consulted by the Panel provided detailed descriptions of export licensing procedures and requirements, in addition to policies to ensure the

extension of export controls to catch-all items not included on the control lists referenced in the relevant Security Council resolutions. The Panel was impressed by the high level of attention to detail shown by many Member States to both the spirit and letter of sanctions provisions regarding export controls.

126. Most Member States provided information regarding their internal procedure for incorporating Security Council resolutions into national legislation, relevant institutions and export control procedures. Many described special interministerial or inter-agency coordinating mechanisms established explicitly for the purpose of implementing the export controls related to the Islamic Republic of Iran contained in the relevant resolutions.

127. It remains that the export controls of some Member States with regard to the Islamic Republic of Iran need further strengthening, especially where legislation, institutions or enforcement mechanisms are deficient. Reasons for less effective export controls in this context may include: lack of awareness of export control obligations because of the absence of relevant industries or production; limited trade with the Islamic Republic of Iran; geographic remoteness; and lack of resources, experience and expertise to exercise effective export controls.

Information sharing

128. Information regarding export denials and suspicious enquiries would help the Panel better to understand patterns of procurement or attempted procurement of sensitive items. The Panel has received such information on an ad hoc basis from some Member States and encourages other Member States also to submit information.

129. The United Kingdom shared with the Panel information regarding denials of export licences in the context of its membership of the Nuclear Suppliers Group. These denials, pertaining to dual-use equipment and technology sought by the Islamic Republic of Iran, were based on catch-all provisions. This information is valuable to the Panel, as it provides insight into Iranian procurement priorities. The Panel would welcome similar sharing of information by other Member States.

(b) Customs authorities and control

130. Customs authorities play a key role in enforcing sanctions. The Panel held discussions with relevant officials during consultations with Member States and inspections of reported violations, and visited Customs facilities, ports and airports.

131. The Panel noted a high standard of technical equipment, in particular automatic systems enabling electronic processing of data, electronic profiling and risk management. The Panel observed the operation of such equipment, including radiation monitoring and X-ray scanning. Many Customs services had testing centres or laboratories to carry out technical testing for verification of specific items, or could call upon such facilities.

132. The Panel was informed that, while the overall policy of Customs authorities was to facilitate trade, if officials determined that a consignment was suspicious, the general practice was not to clear the shipment until there was proper identification of the goods in question, proof of purpose, origin, destination and relevant parties involved.

133. Customs administrations cooperate at the bilateral and multilateral levels. Such cooperation, including information exchange, is facilitated by the World Customs Organization through its global network of regional intelligence liaison offices, although this is not used specifically for sanctions implementation.

(c) Implementation by the private sector

Outreach to industry

134. The private sector is at the forefront of effective export control implementation, and outreach to industry by Member States plays a critically important role in helping to achieve this objective. It raises awareness of national and international obligations, provides current information regarding changes in regulations, promotes internal compliance, reduces the incidence of inadvertent transfers and encourages industry to exercise due diligence over customers.

135. While most Member States consulted by the Panel maintain some level of outreach to local industry, other countries are only just beginning to implement such practices. The Panel continues to emphasize the importance of outreach to the private sector in its consultations.

136. Outreach methods include seminars, training courses, Government publications, websites, press releases, social media, industry-specific briefings and field visits by export control officials.

137. Outreach efforts organized by non-governmental organizations can complement those of Governments. In some Member States, non-governmental organizations play an important role in assisting Governments to raise private-sector awareness of the importance of effective export controls.

Internal compliance programmes

138. Suspicious enquiries point to the need for heightened awareness and vigilance by suppliers. Firms consulted by the Panel routinely require due diligence on the part of sales agents to screen enquiries against sanctions lists, check on end users, exercise caution when dealing with middlemen and consult Government authorities when questions arise. Member States consulted by the Panel report that companies, especially large established firms, are wary of the reputational risk involved with transactions with the Islamic Republic of Iran and regularly avoid them, even in the case of permissible, non-sanctions-related trade.

139. Internal compliance programmes help producers and traders to exercise discipline and vigilance over sensitive dual-use exports. Many Member States promote the establishment of such procedures, in addition to certifying and even monitoring them. Several private-sector producers of sensitive dual-use goods shared with the Panel possible indicators for identifying suspicious enquiries. These included:

(a) Reluctance by the purchasing agent to provide information about the end use and end users;

(b) Inability to answer commercial or technical questions regarding the item sought;

(c) Unconvincing explanation as to why the item is required;

(d) Unusually favourable terms of payment offered;

(e) Requests for unusual shipping, packaging or labelling arrangements;

(f) Requirements for confidentiality regarding final destinations, customers or specifications of items;

(g) Requests for excessive quantities;

(h) Similar enquiries received from multiple agents;

(i) Enquiries received based on common lists with characteristic misspellings;

(j) Request for post-sale modifications to uncontrolled items that would result in the item falling within controls if exported as such;

(k) Changes of consignee address shortly before shipment.

Controls on teaching or training

140. The Panel has raised with Member States the issue of specialized teaching or training in sensitive areas, and observed that a wide range of practices existed to implement those provisions. Some Member States have established working groups with universities to ensure that advanced graduate work by Iranian students is monitored in accordance with Security Council obligations; other Member States are beginning to establish such procedures. Many Member States have a policy to deny student visa requests from the Islamic Republic of Iran for advanced graduate study in sensitive areas, and monitor closely any changes in courses of study.

(d) Iranian procurement efforts

141. The Panel was informed by a number of Member States and one regional multilateral organization that the Islamic Republic of Iran continued to seek items through illicit procurement to support prohibited nuclear and ballistic missile programmes. Among the items cited most frequently were vacuum pumps, perfluoropolyether lubricants and carbon fibre (see paras. 57-67 for greater detail regarding the last-mentioned issue). As noted above, one State provided the Panel with information regarding denials of licences for export issued under catch-all requirements. Examples included process controllers, heat exchangers, flow meters and accessories, and carbon steel tubes.

142. According to the same regional multilateral organization, the Islamic Republic of Iran undertakes this procurement directly and indirectly. Its procurement methods include making direct bids to foreign commercial partners to procure materials with technical documentation, acquiring foreign licences and patents, copying material, conducting mergers of or absorbing foreign companies or purchasing company securities allowing access to technologies, and sending technicians to foreign suppliers for training.

143. The Islamic Republic of Iran is also believed to use indirect strategies for procurement, including:

(a) Making use of front companies;

(b) Concealing the end use or end user and final destination;

(c) Falsifying technical documentation for materials ordered;

(d) Reaching out to multiple suppliers for the same item;

(e) Making use of the Iranian diaspora to facilitate procurement.

3. Challenges

144. **Small and medium-sized enterprises**. Small and medium-sized enterprises are more vulnerable than their larger counterparts to weaknesses in export control systems. They may lack resources, expertise, experience and knowledge of their national and international obligations. Investment in internal compliance programmes can be costly for small firms or seen as excessively burdensome. Small and medium-sized enterprises may also be wary of export controls, which are perceived to hamper business opportunities. Such firms may not have the same aversion to reputational risk as larger firms. Internal compliance programmes are more difficult to implement for small and medium-sized enterprises than for larger firms. Outreach initiatives targeting small and medium-sized enterprises should make it a priority to help such firms to establish internal compliance programmes.

145. **Identification difficulties**. Special expertise is necessary to identify proliferation-sensitive dual-use exports at two stages of the export control process. The first stage is at the time of licensing, when exporters, in particular those who are unfamiliar with their national export control legislation and procedures, may export items without understanding licence requirements. The second stage is at the border, where such expertise is necessary for identifying sensitive exports.

146. **Control lists**. Several Member States consulted by the Panel noted that the lists identified in paragraph 122 had been modified since the adoption of resolution 1929 (2010), and requested that the Panel should recommend the updating of those lists. The current versions of these lists are contained in INFCIRC/254/Rev.8/Part 2, INFCIRC/254/Rev.10/Part 1 and document S/2012/235.

4. Conclusions

147. Member States are implementing export controls with greater awareness of their obligations under United Nations sanctions. While most have well-established mechanisms to coordinate and implement the export licensing process, including of catch-all items falling below established thresholds, some may need assistance to strengthen such programmes and their implementation.

148. Small and medium-sized enterprises are an attractive target for illicit procurement. Outreach to small and medium-sized enterprises engaged in the production and export of sensitive items is critical to the effective implementation of sanctions and, more generally, export controls.

149. Internal compliance programmes have proved an effective tool to help the private sector to implement export controls, although not all companies have such programmes in place.

E. Shipping and transportation

1. Introduction

150. In resolution 1929 (2010), the Security Council called upon all States to inspect all cargo to and from the Islamic Republic of Iran and to cooperate in inspections on the high seas with the consent of the flag State, if there was information that provided reasonable grounds to believe that the vessel was carrying items, the supply, sale, transfer or export of which was prohibited. The Council also decided that States were to prohibit the provision of bunkering services to Iranian-owned or -contracted vessels if they had information that provided reasonable grounds to believe that they were carrying prohibited items.

151. Three Islamic Republic of Iran Shipping Lines entities are designated under resolution 1929 (2010): Irano Hind Shipping Company, IRISL Benelux NV and South Shipping Line Iran (SSL), together with persons or entities acting on their behalf or at their direction and entities owned or controlled by them.

152. In paragraph 20 of resolution 1929 (2010), the Security Council requested all Member States to inform the Committee of transfers of business and activity by the Islamic Republic of Iran Shipping Lines to other companies, including renaming or re-registering of vessels or ships. The same information is requested from Member States in connection with Iran Air's cargo division.

2. Background

153. According to Iranian official statements over the past year, international trade has increased, the sanctions notwithstanding.[19] By contrast, many Member States reported to the Panel significant decreases in trade with the Islamic Republic of Iran, citing such factors as difficulties completing financial transactions, finding carriers and freight forwarders for transporting Iranian-related cargo and obtaining marine insurance coverage. Unilateral sanctions may be a factor in these developments.

154. The Panel was also informed that some shipping companies and freight forwarders had adopted policies to refrain from business with the Islamic Republic of Iran, including transporting cargo to Iranian ports.[20] A number of large cargo transportation firms announced over the past year a suspension or limitation in shipments involving Iranian ports. These include CMA CGM (September 2011), Hapag-Lloyd (November 2011) and Maersk (February 2012).[21] According to an international maritime insurance association consulted by the Panel, marine insurance, including third-party liability insurance, connected with business with the Islamic Republic of Iran is difficult to obtain.[22] The International Air Transport Association suspended the access of two Iranian airlines, including Iran Air, to its

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[19] "UAE official: trade ties with Iran unaffected by sanctions", *Fars News Agency*, 21 August 2011.
"Dubai-Iran trade grows in goods exempt from sanctions", *Tehran Times*, 22 August 2011.
"Iran: minister dismisses effectiveness of sanctions against Iran", *Thai News Service*, 31 August 2011.

[20] "Sanctions blowback crippling Iran's shipping trade", *Reuters*, 1 December 2011.

[21] "Maersk suspends oil tanker trade deals with Iran", *Reuters News*, 8 February 2012.
"French shipper CMA CGM stops exporting from Iran", *Reuters News*, 30 November 2011.

[22] Some of the issues relevant to protection and indemnity cover are discussed in www.igpandi.org/downloadables/news/news/Iran%20FAQs%208%2002%202012.pdf.

payment settlement system for member airlines and travel agents. Two bordering Member States announced limitations in air cargo overflights or the grounding and inspection of all such flights.

3. Analysis

155. The Panel inspected three incidents of non-compliance reported by Member States, two of which involved transport by road and one transport by air. The details of these inspections can be found in paragraphs 100 to 110.

(a) Air transport

156. The Yas Air (Turkey) interdiction was undertaken following a technical stopover imposed by Turkey in response to a series of flight plans submitted by Yas Air and information provided by another State. The incident illustrates the importance of effective, timely and tested inter-agency coordination mechanisms in carrying out successful interdictions of air shipments. These are particularly important because information on overflights with suspicious cargoes may be available with limited notice and decisions may need to be taken by the authorities at the last minute.

157. Yas Air's corporate registration history and the issue of its proposed designation under United Nations sanctions are discussed in more detail in paragraph 231. One of the patterns of circumvention by the Islamic Republic of Iran illustrated in this case involves the renaming of a cargo airline.

(b) Overland transport

158. In the case of the International Security Assistance Force (Afghanistan), in which arms and related materiel were interdicted close to the border in southern Afghanistan, the methods and route used for transporting the prohibited goods resembled smuggling or illicit trafficking of contraband. Experts in border security in this region have noted that the capacity of Customs is limited on both sides of the border and the volume of cross-border trade very high, making it more vulnerable to smuggling.[23]

159. The case of Kilis (Turkey) consisted of arms-related materiel carried by a truck that was legally registered for international road transport. No attempt had been made to physically conceal the shipment or to falsify the documents. The Panel notes that a related shipping document stated that the shipment was part of a contract including 20 such shipments.

(c) Maritime transport

160. No State reported violations involving marine transport during the Panel's current mandate.

161. The Panel visited seven ports during its current mandate to gather relevant information about the implementation of sanctions. Practices vary by State as to the precise role played by port authorities. The Panel notes that there is significant value in coordinating the responsibilities of port authorities with those tasked with the detection of prohibited commodities for the purpose of sanctions implementation or

[23] United Nations Office on Drugs and Crime, *The Global Afghan Opium Trade: A Threat Assessment* (Vienna, July 2011).

export controls. For example, information held by port authorities on vessels entering ports, such as International Maritime Organization numbers, could be shared with the authorities in charge of implementing relevant Security Council resolutions. Inspection tools used by port authorities, even though not designed to detect suspicious cargo, could help relevant authorities to detect suspicious ship operations, including carriage of banned goods.[24]

(d) Measures taken by the private sector

162. The Panel notes that many transport companies are sensitive to the need to comply with sanctions on the Islamic Republic of Iran and have adopted additional measures to reduce the risk of violating relevant Security Council resolutions. These include creation of internal compliance units; enhanced internal compliance procedures, including senior management responsibility for decisions over business with an Iranian connection; advanced risk profiling systems; specialized training of employees; development of internal blacklists of suspicious or risky customers; scanning of all cargo bound for the Islamic Republic of Iran; and mandatory confirmation from business counterparts that their contract is not connected to Iranian prohibited activities. By contrast, some entities have withdrawn from the Iranian market altogether.

4. Transfer, renaming and reflagging of vessels related to the Islamic Republic of Iran Shipping Lines[25]

163. The measures concerning the Islamic Republic of Iran Shipping Lines contained in the relevant resolutions go beyond the designations of the three entities related to the Islamic Republic of Iran Shipping Lines in paragraph 19 of resolution 1929 (2010). States are also called upon to be vigilant over the activities of the Islamic Republic of Iran Shipping Lines in resolutions 1803 (2008) and 1929 (2010). They are obliged under paragraph 22 of resolution 1929 (2010) to require their nationals, persons subject to their jurisdiction and firms incorporated in their territory or subject to their jurisdiction, to exercise vigilance when doing business with entities of the Islamic Republic of Iran Shipping Lines, if they have information that provides reasonable grounds to believe that such business could contribute to the Islamic Republic of Iran's proliferation-sensitive nuclear activities or the development of nuclear weapons delivery systems.

164. These measures are difficult to implement because of actions by the Islamic Republic of Iran Shipping Lines, following the adoption of resolution 1803 (2008), to modify regularly its corporate ownership structure and the names and flags of its vessels. Currently, over 130 vessels related to the Islamic Republic of Iran Shipping Lines are operated by approximately 75 companies, most of which operate just one or only a few vessels. The Panel understands from discussions with shipping industry representatives that such operating practices are uncommon, especially among major shipping lines.

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[24] Hugh Griffiths and Michael Jenks, "Marine transport and destabilizing commodity flows", Stockholm International Security and Peace Research Institute Policy Paper, No. 32 (Solna, 2012). Available from books.sipri.org/files/PP/SIPRIPP32.pdf.

[25] The assessment in the present subsection is based on information from States and the Panel's own research using commercial sources (Lloyd's List's Seasearcher and IHS Fairplay).

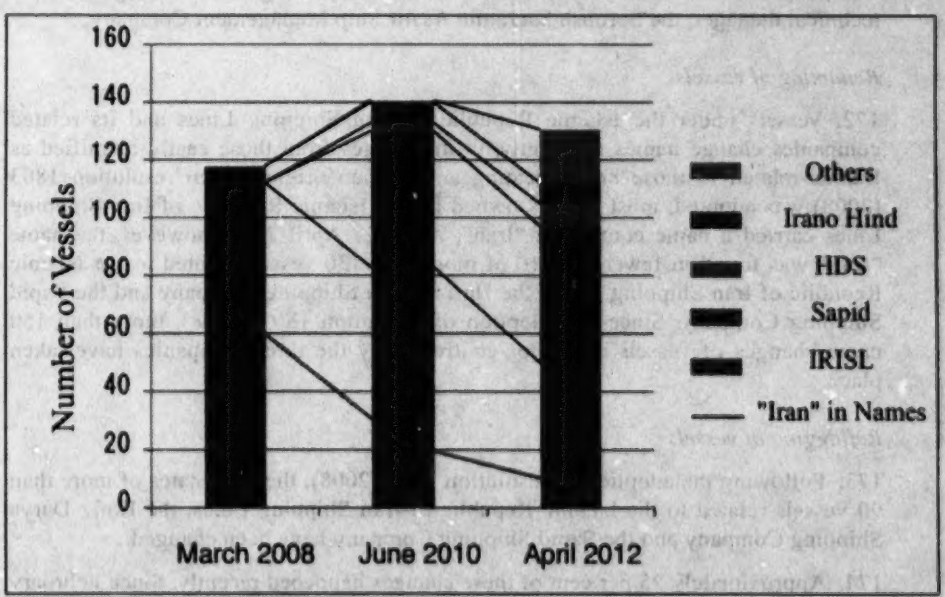
165. These activities, although not in themselves illegal, have introduced a complex and amorphous structure to the Islamic Republic of Iran Shipping Lines that serves to obscure its activities as a whole and the identities of individual vessels.[26] The more complex the overall structure of the Islamic Republic of Iran Shipping Lines, the more difficult and time-consuming the identification of ships related to it.

166. The following is a preliminary assessment of trends. It is intended to provide basic information regarding the activities of the Islamic Republic of Iran Shipping Lines to assist the Security Council and the Committee. It is also intended to assist Member States in exercising effective vigilance over the activities of the Islamic Republic of Iran Shipping Lines in accordance with the relevant Security Council resolutions. Pertinent information from Member States would assist the Panel to develop further its analysis of this issue.

Transfers of vessel ownership

167. At the time of the adoption of resolution 1803 (2008), the first reference to the Islamic Republic of Iran Shipping Lines in a Security Council resolution, the company was the beneficial owner of more than 110 vessels. Following resolution 1803 (2008), it began transferring vessels to two related companies: the Hafiz Darya Shipping Company and the Sapid Shipping Company (see figure IV).

Figure IV
Ownership structure of vessels related to the Islamic Republic of Iran Shipping Lines



Source: Lloyd's List's Seasearcher.

[26] For an analysis of corporate and financial structures that could be used for hiding corrupt transactions, see Emile van der Does de Willebois and others, *The Puppet Masters* (Washington, D.C., World Bank, 2011).

168. From 2008 until the adoption of resolution 1929 (2010), the Islamic Republic of Iran Shipping Lines and its related companies carried out more than 110 changes to the beneficial and registered owners of their vessels. Following the adoption of resolution 1929 (2010), a further more than 110 changes took place.

169. As at 28 April 2012, the Islamic Republic of Iran Shipping Lines was the beneficial owner of 50 vessels, of which 14 were registered as directly owned by it and another 36 by 14 different companies owned in turn by it. In addition, from 35 to 40 vessels are registered to the Islamic Republic of Iran Shipping Lines, although they are either under construction, on construction orders or pending operation.

170. Very few vessels were directly registered to the Hafiz Darya Shipping Company or the Sapid Shipping Company as at 28 April 2012. The eight vessels of the former were registered to seven different companies that it owned. The 47 vessels of the latter were registered to 39 different companies that it owned. Only two vessels were registered to the Sapid Shipping Company itself. Approximately 20 other vessels were related to the Islamic Republic of Iran Shipping Lines, the Hafiz Darya Shipping Company or the Sapid Shipping Company, bringing to more than 130 the number of vessels related to the three companies (including vessels related to the Irano Hind Shipping Company). In many cases, companies under ownership of the Islamic Republic of Iran Shipping Lines, the Hafiz Darya Shipping Company or the Sapid Shipping Company possessed only one or two vessels.

171. More than 60 of the approximately 130 vessels are currently operated by a single Iranian third party operator, the Rahbaran Omid Darya Ship Management Company. In addition, more than 50 vessels are managed by a single Iranian technical manager, the Soush Sarzamin Asatir Ship Management Company.

Renaming of vessels

172. Vessels under the Islamic Republic of Iran Shipping Lines and its related companies change names frequently, in most cases from those easily identified as Iranian-related to those not indicating any Iranian origin. When resolution 1803 (2008) was adopted, most vessels owned by the Islamic Republic of Iran Shipping Lines carried a name containing "Iran". As at 28 April 2012, however, the name "Iran" was found in fewer than 10 of more than 130 vessels related to the Islamic Republic of Iran Shipping Lines, the Hafiz Darya Shipping Company and the Sapid Shipping Company. Since the adoption of resolution 1803 (2008), more than 150 name changes of vessels owned or controlled by the three companies have taken place.

Reflagging of vessels

173. Following the adoption of resolution 1803 (2008), the flag States of more than 90 vessels related to the Islamic Republic of Iran Shipping Lines, the Hafiz Darya Shipping Company and the Sapid Shipping Company have been changed.

174. Approximately 25 per cent of these changes happened recently. Since February 2012, 12 vessels belonging to the Sapid Shipping Company or the Irano Hind Shipping Company have changed their flags to a Latin American State. Since March 2012, eight vessels belonging to the Islamic Republic of Iran Shipping Lines or the Hafiz Darya Shipping Company have shifted their flag to an African State and three vessels belonging to the Hafiz Darya Shipping Company or the Sapid Shipping

Company have changed flags to another African State. The beneficial and registered owners of some of these vessels are unconfirmed.

175. Some of these flag changes were also accompanied by vessel name changes. Vessels with relatively large container capacity changed their names, flags and owners at the same time.

Related services providers

176. Changes in ownership, names and flags can be carried out only by third parties with expertise in legal and procedural issues, such as registration brokerage companies, law firms or corporate services providers. One State informed the Panel that transfers of vessel ownership were apparently obscured by the use of bearer shares provided by such a third party.

5. Conclusions

177. The frequent changes of ownership, name and flag of vessels by the Islamic Republic of Iran Shipping Lines go beyond standard business practice and are suited to obscuring the identity of vessels. Vigilance over the company's activities, in particular monitoring vessels' International Maritime Organization numbers, continues to be important.

178. Vigilance by providers of related services, including ship registration and corporate formation, is also needed.

179. The absence of reported incidents notwithstanding, it is likely that maritime shipments of prohibited items are continuing.

180. Border States are potential targets for illicit transfers or transit of arms and related materiel from the Islamic Republic of Iran.

181. Coordination among port, airport and air traffic control authorities with enforcement agencies enhances the effectiveness of sanctions implementation and their enforcement. In maritime ports and airports, coordination of technical inspections with border control and Customs authorities can enhance implementation of sanctions. Sharing of information routinely obtained by all relevant authorities, including vessels' International Maritime Organization numbers and flight plans of aircraft, is important.

F. Financial and business restrictions

1. Introduction

182. The relevant Security Council resolutions contain two categories of financial restrictions. The first, targeted financial sanctions, require freezing of funds and other assets of designated entities and individuals (resolution 1737 (2006), paras. 12-15; resolution 1747 (2007), para. 6; resolution 1803 (2008), para. 7; and resolution 1929 (2010), paras. 11, 12 and 19). The designated individuals and entities are listed in the annex to resolution 1737 (2006), annex I to resolution 1747 (2007), annexes I and III to resolution 1803 (2008) and annexes I to III of resolution 1929 (2010). Two Iranian financial institutions are designated: Bank Sepah and Bank Sepah International (resolution 1747 (2007)) and First East Export Bank (resolution 1929 (2010)).

183. The second category of restriction is activity-based sanctions, which impose restrictions on financial or business dealings with the Islamic Republic of Iran under specific conditions. The restrictions are as follows:

(a) Preventing the transfer of financial resources or services related to the supply, sale, transfer, manufacture or use of the prohibited items (resolution 1737 (2006), para. 6; and resolution 1929 (2010), paras. 8 and 13);

(b) Preventing the provision of financial services and transfer of financial assets or resources that could contribute to the Islamic Republic of Iran's proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems (resolution 1929 (2010), para. 21);

(c) Prohibiting Iranian banks from initiating new business activities in Member States if related to the Islamic Republic of Iran's proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems (resolution 1929 (2010), para. 23);

(d) Prohibiting financial institutions of Member States from initiating new business in the Islamic Republic of Iran if related to the Islamic Republic of Iran's proliferation-sensitive nuclear activities, or the development of nuclear weapon delivery systems (resolution 1929 (2010), para. 24).

184. The activity-based sanctions of resolution 1929 (2010) build on those set out in resolutions 1737 (2006) and 1803 (2008). Two Iranian financial institutions are named in paragraph 10 of resolution 1803 (2008), in which the Security Council calls upon States to exercise vigilance over the activities of financial institutions in their territories with all banks domiciled in the Islamic Republic of Iran, in particular with Bank Melli and Bank Saderat, and their branches and subsidiaries abroad. Vigilance over transactions involving Iranian banks, including the Central Bank of Iran, was also called for in the sixteenth preambular paragraph of resolution 1929 (2010).

185. Member States are also obliged to require their nationals, persons subject to their jurisdiction and firms incorporated in their territory or subject to their jurisdiction to exercise vigilance when doing business with entities in the Islamic Republic of Iran, including those of the Islamic Revolutionary Guards Corps and the Islamic Republic of Iran Shipping Lines (resolution 1929 (2010), para. 22).

186. In the present section, the Panel discusses the implementation by Member States of United Nations financial sanctions, responses to financial sanctions, practices of entities in response to sanctions requirements and challenges arising from the implementation of financial sanctions.

2. Analysis

(a) Implementation of financial sanctions

187. The Panel consulted Member States to learn about how implementation was carried out in practice and to receive information on sanctions circumvention by the Islamic Republic of Iran. The Panel participated in outreach seminars for Governments and the private sector and sought views from private-sector entities during meetings.

188. To implement financial sanctions, Member States require mechanisms to identify and freeze assets of designated entities and individuals, and to monitor and regulate financial and business transactions with the Islamic Republic of Iran. A high standard of communication and coordination between regulatory authorities and the private sector is needed.

189. While many Member States noted that they had such systems in place, only a few shared information regarding suspicious transaction reports, violations or attempted violations. For example:

(a) One State bordering the Islamic Republic of Iran said that it had revoked the licence of a money transfer company in 2008;

(b) One State informed the Panel that its financial intelligence unit had received and investigated several suspicious transaction reports in connection with transactions involving Bank Saderat during the period 2006-2007. It could not be ascertained that those were relevant to United Nations resolutions. The financial intelligence unit had also carried out checks on the basis of information received from other Member States during 2007, but no information had been found related to United Nations sanctions;

(c) One State said that on-site inspections of Bank Mellat had identified two examples of failure to follow proper procedures;

(d) One State noted that transactions from banks in one Middle Eastern State with Iranian shareholders had been blocked based on intelligence received from foreign sources.

190. There is no general understanding of the definition of "vigilance" in the context of paragraph 22 of resolution 1929 (2010). Member States reported various mechanisms to comply with this requirement, such as:

(a) Some regulatory authorities closely supervised business with the Islamic Republic of Iran;

(b) Some authorities required notification or authorization in advance for transfers of funds involving an Iranian person or entity over specific thresholds. One State reported a requirement for non-personal financial transactions to be licensed on a case-by-case basis. Other Member States had systems in place to license individual financial transactions, or to license a class of financial transactions;

(c) Some Member States reported that they simply generally supervised business to ensure that no prohibited activities took place.

191. The Panel received no reports that the Islamic Republic of Iran had successfully developed significant new channels for transactions following the adoption of resolution 1929 (2010), although some Member States shared information that it remained interested in doing so. One State noted that monitoring Iranian-related transactions through banks in some third countries was difficult. One State bordering the Islamic Republic of Iran informed the Panel of Iranian requests to open new financial institutions. Those requests were not pursued, apparently because of that State's burdensome legislation. Another State, on another continent, disclosed similar requests. Another State said that the Islamic Republic of Iran had requested information about procedures for opening financial institutions using Iranian or mixed capital. In most cases, the Islamic Republic of Iran did not pursue these enquiries.

192. The compliance department of one large international financial institution stated that the Islamic Republic of Iran was known to be seeking to develop covert relationships with existing institutions, and new relationships in jurisdictions with weak regulations. A representative of another large international financial entity also noted that Iranian banks were creative in seeking to circumvent sanctions, including by opening new branches.

193. The Financial Action Task Force issued revised standards in February 2012, including a new standard on implementation of targeted financial sanctions related to proliferation. Member States may need to put in place mechanisms to meet this standard. The inclusion of this standard in future mutual evaluation reviews could provide the Panel with useful information regarding the implementation of United Nations targeted financial sanctions.

(b) Responses to financial sanctions

194. Member States informed the Panel that Iranian entities and citizens not designated under sanctions were deploying measures to deal with the effects of sanctions, in particular unilateral ones, some of which might be intended only to protect legitimate transactions, such as:

(a) An increasing number of Iranian-related financial transactions involved non-sanctioned Iranian banks with correspondent accounts with foreign banks, or money transfer businesses based in the Islamic Republic of Iran with access to foreign banks. Some of those transactions might have been initiated by sanctioned banks;[27]

(b) An increase in cash transfers between Iranians resident overseas and their friends and relatives inside the Islamic Republic of Iran, which was notable in Member States with many Iranian residents. One State, which monitors all cross-border financial transactions, reported a several-fold increase over the past two years in cash transfers to the Islamic Republic of Iran. The State suggested that sanctions had made electronic transfers more difficult. Another factor was the increasing regulation of money transfer businesses, which were now required to register as financial institutions. The media also reported an increase in cash transactions;[28]

(c) One State said that hawala transactions had increased in recent years in inverse proportion to the reduction of bank transactions with the Islamic Republic of Iran;

(d) One border State reported that barter transactions were a growing component of trade with the Islamic Republic of Iran. Barter arrangements were also reported by the media;[29]

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[27] See also media reports, such as Benoît Faucon and Margaret Coker, "Willing banks find profits in legal trade with Iran", *Wall Street Journal*, 8 April 2012.

[28] Michael Lipin, "Western sanctions on Iran's banks make trade harder", *Voice of America News*, 3 April 2012.

[29] Valerie Parent and Parisa Hafezi, "Iran turns to barter for food as sanctions cripple imports", *Reuters*, 9 February 2012. Indira Lakshmanan and Pratish Narayanan, "India and China skirt Iran sanctions with 'junk for oil'", *Bloomberg*, 30 March 2012.
"Pakistan, Iran holding talks on barter trade", *Tehran Times*, 22 April 2012.

(e) Some Member States reported cases of companies set up for the purpose of transferring funds to or from the Islamic Republic of Iran. For example, the Panel was informed of the case of a small non-financial firm led by an expatriate Iranian that had transformed itself into a company involved in transferring funds received from a non-sanctioned Iranian bank to recipients throughout the world. Some $11 billion had been processed over 18 months.

195. Understanding whether and how the above-described methods could be used for financing procurement for sanctioned nuclear and ballistic programmes is challenging. These programmes are industrial in scale and require sources of financing for procurement that are large and reliable.

(c) Practices of financial entities

196. The Panel held discussions with representatives of several international financial institutions, insurers, banking associations and legal entities in Europe, Asia and North America.

197. For the purposes of implementing United Nations targeted sanctions, many large financial institutions said that they relied on commercial software providers for systems to screen transactions. Screening against individuals designated by the United Nations was often complicated by a lack of sufficient identifying detail. Most institutions required screening to be able to identify possible non-compliance under all relevant jurisdictions in which they operated. Some providers offered screening services against additional, proprietary criteria. Most institutions said that they deployed many staff and expended significant resources to ensure that adequate due diligence was carried out.

198. The Panel was informed by many institutions and regulatory authorities that they took a highly risk-averse approach to compliance with sanctions on the Islamic Republic of Iran. Many regarded possible penalties for violating unilateral sanctions (in addition to negative publicity and reputational damage) as of greater concern than possible violations of United Nations sanctions, and formulated corporate compliance procedures accordingly. Some entities reported that they had decided that resources needed for adequate compliance with all relevant sanctions regimes were too costly where business was connected with the Islamic Republic of Iran and had decided to do no such business at all.

199. Channels for transactions with some Iranian banks have been blocked following the termination of financial messaging services to these banks in response to unilateral financial sanctions.[30]

200. The Panel observed that the practices of many financial institutions were widening the scope of United Nations financial sanctions. For example, two large insurance entities informed the Panel that company policy was to turn down almost all business connected with the Islamic Republic of Iran because of the burdensome nature of necessary due diligence and potential complexities should a claim arise. Many protection and indemnity clubs have terminated third-party liability cover for Iranian vessels because of unilateral sanctions. The Panel was informed that Iranian insurance companies might provide alternative cover. It is unclear whether the compliance policies of international banks would allow transactions to be processed should Iranian insurance companies pay out against a claim.

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[30] Society for Worldwide Interbank Financial Telecommunication, www.swift.com/news/press_releases/SWIFT_disconnect_Iranian_banks (accessed 7 May 2012).

3. Challenges

(a) Asset freezes

201. Only a few Member States reported that assets had been frozen in response to Security Council resolutions. Most Member States informed the Panel that no assets had been frozen because no relevant assets had been present. Two said that business related to the Islamic Republic of Iran had already scaled back significantly by the time that United Nations asset freezes were put in place.

202. There are several possible reasons for the lack of reports of assets frozen under the relevant United Nations resolutions. Some Member States may lack mechanisms to freeze assets in connection with the resolutions, or may have failed to take action swiftly to ensure that no funds were removed from their jurisdiction before such freezes took effect. Some Member States may require assistance or advice in the implementation of asset freezes. For example, one State enquired about procedures followed elsewhere with regard to property subject to asset freezes.

203. A banking association reported to the Panel in writing that its members were concerned about the ability of the competent authorities to respond to enquiries and licensing requests in a timely manner. Many competent authorities struggled with the lack of precision in the language of United Nations resolutions (such as the definition of "acting on their behalf").

(b) Unilateral sanctions

204. The issue of unilateral financial sanctions is not within the Panel's mandate. The issue is, however, raised often by Member States in the course of the Panel's consultations regarding United Nations financial sanctions. In addition to United Nations sanctions on the Islamic Republic of Iran, a number of jurisdictions have imposed their own financial sanctions regimes (referred to here as "unilateral sanctions regimes"). Such regimes and sanctions have increased over the past year. Some Member States reported that they sought to comply with both United Nations sanctions and unilateral regimes, and others that they complied only with United Nations sanctions.

205. One example of the difficulties imposed by unilateral sanctions on legitimate transactions is illustrated by an enquiry from an international humanitarian organization to the United Nations regarding the transfer of funds from the Islamic Republic of Iran. The Committee, assisted by the Panel, subsequently recommended that the humanitarian organization should seek advice from Member States that had jurisdiction over their activities regarding restrictions imposed by sanctions regimes, and, where necessary, request such Member States to seek an exemption from the Committee in connection with the transfer of items, financial resources or assets to or from the Islamic Republic of Iran.

206. One State reported that it had been approached by an international humanitarian organization for advice on transferring funds to the Islamic Republic of Iran following the imposition of unilateral sanctions. The State responded that it could not influence the policies of individual banks.

207. The media also reported difficulties with humanitarian transactions.[31]

[31] Arshad Maohammed, "Of diapers and drugs, Iran's trouble paying bills", *Reuters*, 21 March 2012.

4. Conclusions

208. The Panel finds a high level of awareness among Member States and the private sector of United Nations financial sanctions. Many Member States are implementing sanctions through their financial regulatory bodies with rigour.

209. Understanding whether and how Iranian circumvention of United Nations financial sanctions could be used for financing procurement for sanctioned nuclear and ballistic missile programmes is challenging. These programmes are industrial in scale and require sources of procurement financing that are large and reliable.

210. Legitimate trade may be hindered by the practices for financial transactions followed by some entities in response to unilateral sanctions.

G. Designation of entities and individuals

1. Introduction

211. Designated entities and individuals are subjected to asset freezes set forth in paragraphs 11, 12 and 19 of resolution 1929 (2010) and previous resolutions. They are also subject to travel ban measures under paragraph 10 of resolution 1929 (2010). The travel ban is discussed further in paragraphs 232 to 247 of the present report.

212. Consolidated lists of designated individuals and entities can be found on the Committee's website.[32] The current list falls into three categories: those concerning other individuals and entities involved in the Islamic Republic of Iran's nuclear or ballistic missile activities; designations related to the Islamic Revolutionary Guards Corps (also known as "Army of the Guardians of the Islamic Revolution"); and those related to the Islamic Republic of Iran Shipping Lines.

213. In the present section, the Panel discusses the Islamic Revolutionary Guards Corps, the Irano Hind Shipping Company and the entities and individuals that have come to the Panel's attention as a result of inspections carried out of reported violations.

2. Islamic Revolutionary Guards Corps

214. Although the Islamic Revolutionary Guards Corps as a whole is not designated under the relevant resolutions, a number of key figures have been identified by the Security Council as involved in nuclear and ballistic missile programmes and are subject to asset freeze measures. Officers, including the Corps' Commander-in-Chief and Joint Chief of Staff, in addition to the commanders of the air force, ground force and navy, are all designated. Furthermore, three entities identified in annex I to resolution 1747 (2007) and Khatam al-Anbiya Construction Headquarters and 14 entities related thereto are designated in annex II to resolution 1929 (2010).

215. Activities related to the Islamic Revolutionary Guards Corps are also made subject to vigilance exercised by States and their nationals, persons and firms if they have information that provides reasonable grounds to believe that such business could contribute to the Islamic Republic of Iran's proliferation-sensitive nuclear activities or the development of nuclear weapons delivery systems. Such vigilance

[32] See www.un.org/sc/committees/1737/pdf/1737ConsolidatedList.pdf.

over business activities extends to entities and individuals acting on behalf of the Corps or at its direction, and entities owned or controlled by it, including through illicit means.

216. The consultations with many Member States showed the difficulty of identifying specific transactions or businesses involving the Islamic Revolutionary Guards Corps that could contribute to Iranian proliferation-sensitive nuclear activities or the development of nuclear weapons delivery systems. Part of the problem lies in the lack of information regarding the structure of the Corps and its activities, both inside the Islamic Republic of Iran and abroad.

217. This lack of information means that foreign entities seeking to carry out legitimate trade with the Islamic Republic of Iran run the risk of becoming unwittingly involved in the above-mentioned prohibited activities of the Islamic Revolutionary Guards Corps, and thus violating relevant Security Council resolutions. To avoid such risks, which could result in significant legal penalties and reputational damage, many entities decide to withdraw from any business that might be connected with the Islamic Republic of Iran or Iranian elements, regardless of the legitimate nature of such business.

(a) Economic activities by the Islamic Revolutionary Guards Corps

218. The Islamic Revolutionary Guards Corps is an overwhelmingly important actor in the Iranian economy and has expanded into various sectors, mainly through its civilian arms. Although experts find it difficult to determine the extent of its influence on the economy, conservative estimates suggest that it exercises control of between 25 and 40 per cent of the Iranian gross domestic product.[33]

219. For example, the construction wing of the Corps, Khatam al-Anbiya Construction Headquarters, which is designated under resolution 1929 (2010), is engaged in numerous projects, including dams, buildings, roads, tunnels and underground structures, ports, oil installations, telecommunications, transportation, energy and transmission lines for oil, gas, water and sewage. It has dozens of subsidiaries and partners. One estimate even suggests that it has more than 800 subsidiaries[34] and, according to the entity itself, it has completed hundreds of projects.[35] The position of its Director is traditionally occupied by influential officers of the Islamic Revolutionary Guards Corps. The current Minister of Oil, Rostam Qasemi, is a former Director.[36] Other major projects, such as airport operations, are carried out by other construction entities under the control of the Corps.

220. Some Member States have informed the Panel that the Corps also controls informal economic channels. In particular, some Iranian charitable organizations (foundations) controlled by the Corps are believed to support the Corps' economic activities, including provision of informal channels for business transactions. Such foundations include the Islamic Revolutionary Guards Corps Cooperative

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[33] Elliot Hen-Tov and Nathan Gonzalez, "The militarization of post-Khomeini Iran: Praetrorianism 2.0", *The Washington Quarterly*, winter 2011.

[34] "New Iran sanction target Revolutionary Guards", *Time Magazine*, 10 June 2010.

[35] See Khatam al-Anbiya Construction Headquarters website, "Ghorb at a glance" (http://khatam.com/?part=menu&inc=menu&id=98) (accessed 22 April 2012).

[36] The Director was reportedly replaced by Abolqasem Mozaffari Shams in August 2011, after his predecessor was appointed and confirmed as Minister of Oil.

Foundation (Bonyad-e Taavon-e Sepah) and the Foundation of the Oppressed (Bonyad-e Mostazafan), both of which include incumbent and/or former officers of the Corps as board members. Both foundations operate extensive businesses; for example, the Foundation of the Oppressed recently announced that 20 holding companies and 173 companies were operating under it, in a range of industries, including the agriculture, shipping, finance and beverages industries.[37]

(b) Leadership of the Corps

221. Although it appears that individuals were designated by the Security Council according to the leadership positions that they occupied within the Corps, subsequent personnel changes have taken place in the leadership of the Corps. These are not reflected in the list of designated individuals on the Committee website. The changes are reflected in the table below.

Changes in Islamic Revolutionary Guards Corps leadership

Designated individual	*Position*	*Current commanders*
MG Yahya Rahim Safavi	Commander of the Corps	MG Mohammad Ali Jafari
BG Morteza Rezaie	Deputy Commander of the Corps	BG Hossein Salami[38]
BG Mohammad Reza Zahedi	Commander of the Ground Force	BG Mohammad Pakpour
BG Hossein Salami	Commander of the Air Force[39]	BG Amir Ali Hajizadeh
RA Morteza Safari	Commander of the Navy	RA Ali Fadavi
BG Mohammad Hejazi	Commander of the Basij Resistance Force	BG Mohammad Reza Naqdi[40]
BG Qasem Soleimani	Commander of the Qods Force	(Promoted to MG)

Abbreviations: MG, Major General; BG, Brigadier General; RA, Rear Admiral.

222. Some designated individuals who have moved from the positions that they occupied when they were originally designated continue to hold influential positions. These include Major General Yahya Rahim Safavi (currently a military adviser to the Supreme Leader) and Brigadier General Mohammad Hejazi (Head of Logistics and Industrial Research in the Joint Staff of the armed forces).

[37] See the website of the Foundation of the Oppressed: economic activities (www.irmf.ir/activity/Introduce/economic.aspx) (accessed 22 April 2012).

[38] Designated as Air Force Commander under resolution 1737 (2006).

[39] The air force was renamed as the "aerospace force" as a result of restructuring in late 2009.

[40] Designated as a former Deputy Chief of Armed Forces General Staff for Logistics and Industrial Research under resolution 1803 (2008).

3. Designated entity related to the Islamic Republic of Iran Shipping Lines: the Irano Hind Shipping Company

223. The Irano Hind Shipping Company is designated in accordance with paragraph 19 of resolution 1929 (2010), and its funds, assets and economic resources are to be frozen by Member States. The Panel received information that assets of the Irano Hind Shipping Company in one Member State were frozen.

224. On the basis of the Panel's analysis, which is based on information from Member States and the Panel's own research using commercial sources (Lloyd's List's Seasearcher and IHS Fairplay), it appears that the company's vessels continue to operate. The Panel has identified at least seven vessels — three crude oil tankers and four bulk carriers — that have been controlled by the Irano Hind Shipping Company since the time of its designation. There may also be an additional crude oil tanker registered by the Irano Hind Shipping Company but not yet in operation. These seven vessels are registered and operated by seven separate companies, each owning and operating just one vessel. These companies, and an additional five companies that do not appear to operate any vessels, are owned by the Irano Hind Shipping Company and share the same address. An official website of a State also suggests that all these companies are subject to United Nations/European Union sanctions.[41]

225. In April 2012, companies controlled by the Irano Hind Shipping Company changed the flags of all three crude oil tankers belonging to the Company's fleet, from that of Malta to that of the Plurinational State of Bolivia. The Director of the Bolivian International Ship Registry stated on 18 April that, if any of the ships were in breach of sanctions imposed by the United Nations, or other group of countries, its registration would be cancelled.[42] This reflagging coincides with other reflagging activities described in paragraphs 174 to 176.

226. The Irano Hind Shipping Company fleet currently includes no container carriers. The fleet previously included two container carriers, the registrations of each of which were transferred, before the adoption of resolution 1929 (2010), to different owners in one State. The beneficial ownership of both was transferred to an owner in a third State. These two container carriers appear to be in operation mainly in Europe and South America. A list of the above-mentioned companies and vessels can be found in annex X to the present report.

227. The continued operation of the Irano Hind Shipping Company vessels may reflect several factors:

(a) Some Member States may not interpret the resolutions as requiring them to detain vessels owned or controlled by the designated entities;

(b) There may not be a common understanding of terms such as "acting on behalf of Irano Hind and at its direction" or "owned or controlled" by the Irano Hind Shipping Company;

(c) Member States may lack sufficient legal grounds to enable or justify action;

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[41] See http://rocsupport.mfsa.com.mt/pages/default.aspx.

[42] Daniel Fineren, "Bolivia poised to de-flag Iranian ships", *Reuters*, 18 April 2012.

(d) Member States may be unable to identify vessels operating in their territorial waters as being controlled by the Irano Hind Shipping Company.

4. Entities involved in violations: proposed additional designations

228. The Panel notes that the Committee's recent decision to add two individuals and one entity to the list of designations will send a strong message that the resolutions are subject to updating as circumstances dictate.

229. The Panel proposes that the following entities be brought to the Committee's attention:

(a) **Yas Air**. The airline was found by the Panel to be in violation of paragraph 5 of resolution 1747 (2007) for transporting prohibited arms and related materiel from the Islamic Republic of Iran to the Syrian Arab Republic. One Member State provided the Panel with information that Yas Air was an Islamic Revolutionary Guards Corps entity and a successor to Pars Aviation Services Company, which was designated under resolution 1747 (2007). Open-source information shows that Yas Air is a civilian arm of the Islamic Revolutionary Guards Corps and that two of the four cargo aircraft that it possesses were transferred from the Corps;[43]

(b) **SAD Import Export Company**. The company was found by the Panel to be in violation of paragraph 5 of resolution 1747 (2007) for its role as a trading agent of prohibited arms and related materiel. Documentary evidence showed that the entity was found to have attempted to transport prohibited items connected with two entities designated under the relevant Security Council resolutions (7th of Tir Industries and Parchin Chemical Industries). Documentary evidence found during the inspection suggests that transport of similar items might continue in the future;

(c) **Chemical Industries and Development of Materials Group**. The group was identified on papers found in a crate seized in the Kilis (Turkey) case. It is a parent entity of Parchin Chemical Industries, which is a designated entity under resolution 1747 (2007), and was identified as the producer of increment charges seized by the Turkish authorities in the Kilis case. The Defence Industries Organization website suggests that the Chemical Industries and Development of Materials Group is producing a range of explosive materials, including propellant and strong explosives for military use, such as RDX and HMX.[44] The Panel notes that in many of the prior violation cases that it inspected the Defence Industries Organization was found to be engaged in the export of arms and related materiel in violation of the relevant resolutions.

5. Conclusions

230. Further sharing of information among Member States regarding the structure, affiliates and cooperatives of the Islamic Revolutionary Guards Corps would help to understand which of their economic activities could contribute to activities prohibited under the relevant Security Council resolutions.

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[43] See AeroTransport Data Bank (www.aerotransport.org).

[44] See www.diomil.ir/en/cidmg.aspx.

231. The designation of the Irano Hind Shipping Company notwithstanding, its vessels are continuing to operate, which raises questions regarding the practical impact of this designation.

H. Travel ban

1. Introduction

232. The Security Council designates individuals and entities for being directly involved with or providing support for the Islamic Republic of Iran's proliferation-sensitive nuclear activities and for the development of nuclear weapon delivery systems in resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1929 (2010). In paragraph 10 of resolution 1929 (2010), the Security Council decided that all States were to take the measures necessary to prevent the entry into or transit through their territories of individuals designated in the relevant Security Council resolutions or by the Security Council or the Committee in accordance with paragraph 10 of resolution 1737 (2006), with the exceptions stipulated in paragraph 6 of resolution 1803 (2008) and paragraph 10 of resolution 1929 (2010).

233. In the present section, the Panel focuses on challenges reported by Member States in the implementation of the travel ban and developments that may affect the efficacy of travel ban measures.

2. Background

234. The Islamic Republic of Iran issues passports in accordance with international guidelines on machine-readable travel documents. In July 2007, it announced that it had begun issuing diplomatic and service passports containing biometric information, extending that to ordinary passports in February 2011.

235. According to a public database on visa restrictions, the number of countries and territories that can be entered by an Iranian citizen without a visa, usually for relatively short visits, increased from 25 (in September 2008) to 36 (in August 2011).[45]

236. Significant progress has been made over the past decade in the implementation of immigration controls, such as deployment of advanced passenger information systems and biometric data. Only four Member States have yet to begin issuing machine-readable travel documents to their citizens. Such systems and instruments are effective tools in the implementation of the travel ban.

3. Analysis

Implementation by Member States

237. The legal frameworks within which Member States implement travel ban obligations vary considerably. Many Member States implement the travel ban through administrative measures based on existing laws, in effect relying on

[45] Henley & Partners Visa Restrictions Index — Global Ranking, available on its website (www.henleyglobal.com/citizenship/visa-restrictions/). The International Air Transport Association explains in its website that the global ranking is produced in collaboration with the Association, i.e. the methodology developed by Henley & Partners for the global ranking is applied to data provided by the Association's visa information database.

agencies responsible for visa or entry/transit screening to incorporate new information about designated individuals into existing databases. Some make amendments to existing immigration laws, while others implement the travel ban through specific sanctions legislation.

238. Member States implement the travel ban by means of both visa restrictions and border or immigration control measures. The Panel notes that Member States rely on various databases for visa and entry/transit screening. These may include national databases or those common to a regional body, such as the Schengen Information System among European Union States.

239. No reported violations of the travel ban were submitted to the Committee during the Panel's current mandate.

240. The Panel was informed by a State that members of the Qods Force of the Islamic Revolutionary Guards Corps, including its commander Qasem Soleimani (who is designated in resolution 1747 (2007)), recently visited the Syrian Arab Republic. The Panel is seeking to confirm this information. Another State informed the Panel of one case of a designated Iranian individual being denied entry.

241. There may be several reasons for the lack of reports to the Committee regarding travel ban violations. Member States may lack sufficient capacity to implement, monitor and report violations of the travel ban, or it is possible that designated Iranians may not travel outside the country, or may travel with documents issued under other names.

4. Challenges

242. **Insufficient identifying information**. Many Member States, in particular those that deployed computerized screening, reported that their visa, entry and transit procedures required more information than is typically contained in resolutions (which include in most cases only names, places of work and/or job titles).

243. **Difficulties with names**. The Panel notes the following difficulties in identifying designated individuals:

(a) Naming practices in the Islamic Republic of Iran and its surrounding region may involve frequent and repeated use of very common names and surnames;

(b) Variable transliterations of Farsi names into English;[46]

(c) Use of aliases.

244. **Use of additional passports**. One State recently consulted by the Panel suggested that some Iranian nationals have obtained passports from another Member State. The Panel is aware that some Member States legally offer a second citizenship and passport to nationals of a third country, including Iranians who are residing outside their territories, usually in return for a certain amount of investment. Following enquiries from the Panel, information provided by a State showed a four-fold increase in applications from Iranian nationals for passports during the period 2010-2011. The State also reported that it was suspending the acceptance of

[46] In this regard, the Panel notes that names indicated on Iranian passports are not based on a uniform transliteration rule, as indicated by the Ministry of Foreign Affairs of the Islamic Republic of Iran on its website (see www.mfa.gov.ir/NewsShow.aspx?id=817&menu=199&lang=en).

applications from Iranian nationals residing in the Islamic Republic of Iran to prevent potential misuses.

245. **Host nation obligations**. One State reported potential challenges in connection with its obligations to host international organizations. In accordance with host country agreements with international organizations, such Member States are obliged to facilitate the entry into their territory, and to place no impediment in the way of the departure from it, of persons, including representatives of States members of the international organizations that they are hosting. The State noted that it might encounter a situation in which a bilateral agreement with an international organization obliged it to accept the entry of designated Iranian individuals, even if the Security Council did not approve an exemption to the travel ban imposed on such individuals.

5. Conclusions

246. Additional biographical information, such as place and date of birth, passport numbers and parents' names, are necessary for the effective enforcement of travel ban provisions. Additional useful information could include alternative spellings of names, noms de guerre, known addresses, photographs and biometric data.

247. One State reported a four-fold increase in applications for second passports by Iranian citizens. This practice is common to several countries and should be brought to the attention of Member States.

IV. Recommendations

248. **The Panel recommends to the Security Council and the Committee, in accordance with existing practice, the designation of the following two entities found to be in violation of paragraph 5 of resolution 1747: Yas Air, for the transport of prohibited arms and materiel from the Islamic Republic of Iran as described in the Yas Air (Turkey) case, and SAD Import Export Company, for its role as a trading agent of prohibited arms and related materiel as described in the Kilis (Turkey) case. Both recommended designations are supported by strong documentary and factual evidence.**

249. **In addition, the Panel draws the attention of the Security Council and the Committee to the Chemical Industries and Development of Materials Group.**

250. **The Panel recommends that the Security Council and the Committee remind Member States of their duty to report incidents of non-compliance and interdictions. The Panel further recommends that Member States be requested to share information, as appropriate, regarding attempts to circumvent sanctions. The Panel welcomes information, in particular regarding designated Islamic Revolutionary Guards Corps and Islamic Republic of Iran Shipping Lines entities, including information from flag States accepting Islamic Republic of Iran Shipping Lines registrations.**

251. **The Panel recommends that the Committee encourage Member States hosting industrial facilities producing dual-use items necessary for prohibited nuclear and ballistic missile programmes, such as high grades of carbon fibre, to undertake an organized outreach effort to the manufacturing industry to alert its member companies of possible avenues for procurement by the Islamic**

Republic of Iran. Information regarding such outreach efforts should be shared with the Panel, as appropriate.

252. **The Panel recommends that the Committee encourage Member States to undertake outreach initiatives targeting in particular small and medium-sized enterprises, with the aim of establishing appropriate compliance procedures in order to meet obligations under Security Council resolutions.**

253. **The Panel recommends that the Committee remind Member States of the need to maintain a high degree of vigilance over goods transported to and from the Islamic Republic of Iran, whether by sea, air or overland, including rail and road transport. Such vigilance could include requesting technical stopovers for the purpose of inspecting suspicious cargoes when granting overflight rights to and from the Islamic Republic of Iran. This vigilance should not be restricted to zones geographically adjacent to the Islamic Republic of Iran given the global reach of Iranian activities.**

254. **The Panel recommends that the Committee draw the attention of Member States to the new Financial Action Task Force standard on financing of proliferation, in particular when implementing targeted financial sanctions on the Islamic Republic of Iran.**

255. **The Panel recommends that the Committee clarify the measures expected of Member States in implementing sanctions against designated Islamic Republic of Iran Shipping Lines entities, in particular with regard to "financial assets and economic resources", and whether this includes the obligation to seize vessels.**

256. **The Panel recommends that the Committee address discrepancies between the lists of individuals designated under resolution 1929 (2010) and previous resolutions, and those who now hold the positions identified in these designations.**

257. **The Panel recommends that the Committee seek from Member States, on a voluntary basis, additional identifying information regarding designated individuals in order to allow more accurate identification of such individuals and to eliminate false matches.**

258. **The Panel requests that the Committee consider updating the lists referred to in paragraph 13 of resolution 1929 (2010).**

Annex I

Reports submitted to the Committee

Midterm report: S/AC.50/2011/COMM.87

Inspection and investigation reports:

Space launch vehicle: S/AC.50/2011/NOTE.43

International Security Assistance Force: S/AC.50/2011/NOTE.44

Yas Air (Turkey): S/AC.50/2011/NOTE.47

Kilis (Turkey): S/AC.50/2012/NOTE.10

Quarterly assessments of national implementation reports:

July 2011: S/AC.50/2011/COMM.7/Add.2

October 2011: S/AC.50/2011/COMM.7/Add.3

January 2012: S/AC.50/2012/COMM.8

April 2012: S/AC.50/2012/COMM.36

Annex II

List of countries visited

Armenia

Australia

Bahrain

Belarus

Belgium

Brazil

Bulgaria

Canada

India

Israel

Kenya

Malaysia

Morocco

Norway

Oman

Romania

Singapore

Spain

Sweden

Switzerland

Turkey

Ukraine

United Arab Emirates

United Kingdom of Great Britain and Northern Ireland

United States of America

Viet Nam

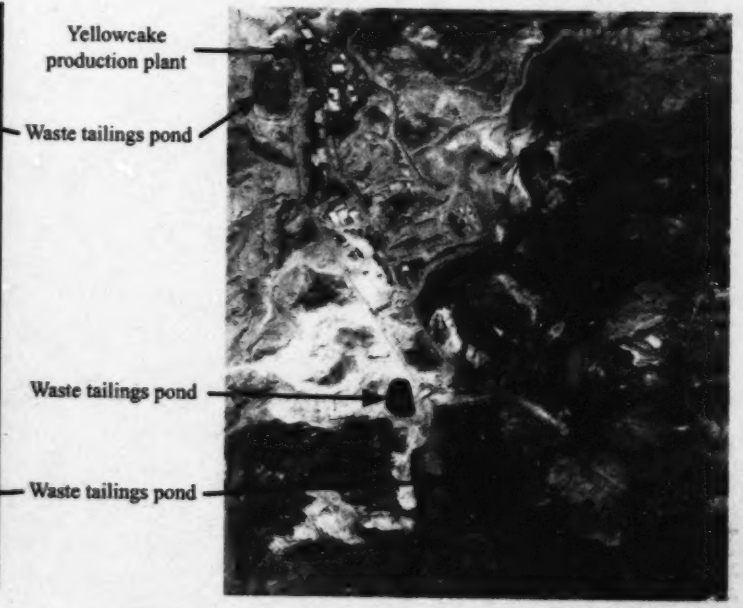
Annex III

Uranium mining and processing in the Islamic Republic of Iran

Gchine Mine and Mill — 2009

Source: GeoEye via Google Earth.

Gchine Mine and Mill — 2012



Source: DigitalGlobe — Institute for Science and International Security.

Saghand Mine — October 2009

Source: GeoEye via Google Earth.

Saghand Mine — March 2012

Source: DigitalGlobe — Institute for Science and International Security.

Indications of some tunnelling activity, but no evidence of open stockpiling of ore. There are more buildings and paved roads compared to 2009.

Ardakan Yellowcake
Production Plant — May 2009
(not operational)

Source: GeoEye via Google Earth.

Initial excavation for waste tailings pond

Lined waste tailings pond

Yellowcake production plant

Ardakan Yellowcake
Production Plant — 2012
(not operational)

Source: DigitalGlobe — Institute for Science and International Security.

Annex IV

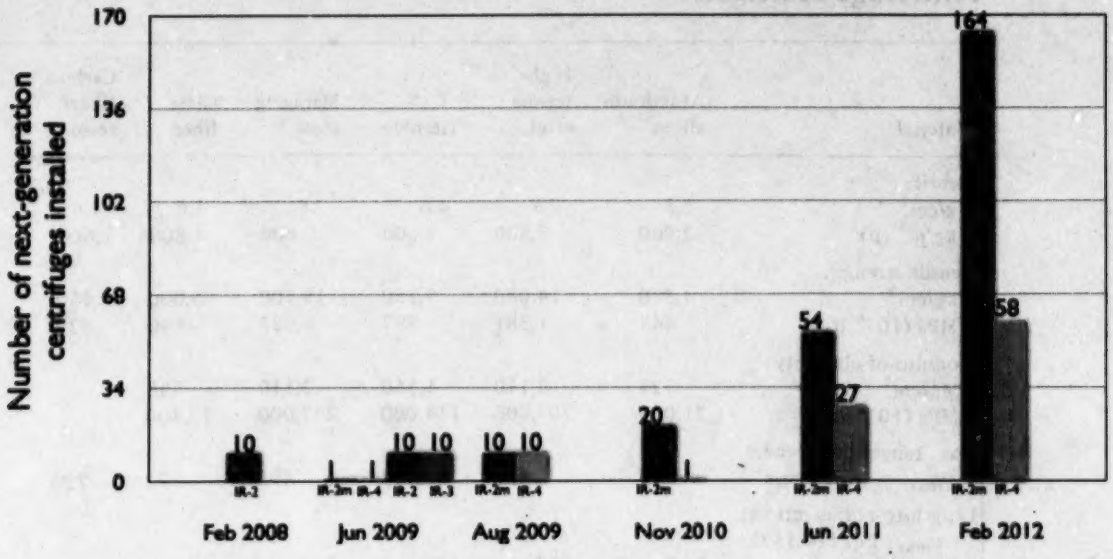
Physical properties and operating limits of possible centrifuge materials

Material	Aluminum alloys	High-tensile steel	Titanium	Maraging steel	Glass fiber	Carbon fiber/ resin
Density						
g/cm^3	2.8	7.8	4.6	7.8	1.8	1.6
kg/m^3 (ρ)	2,800	7,800	4,600	7,800	1,800	1,600
Tensile strength						
kg/cm^2	4,570	14,080	9,150	19,700	5,000	8,450
MPa (10^{-6} σ)	448	1,381	897	1,932	490	829
Modulus of elasticity						
Mg/cm^2	724	2,110	1,160	2,110	738	
MPa (10^{-6} E)	71,000	207,000	114,000	207,000	72,400	
Max. tangential speed, $v_{max} = \sqrt{\sigma/\rho}$, m/s	400	421	442	498	522	720
Length-to-radius ratio at v_{max}, Eq. (14.153)						
First resonance	14.0	13.8	13.2	13.8	13.8	
Second resonance	23.4	23.1	22.2	23.1	23.0	
Third resonance	32.8	32.4	31.1	32.4	32.2	
Fourth resonance	42.2	41.6	39.9	41.6	41.4	
Fifth resonance	51.5	50.8	48.8	50.8	50.6	

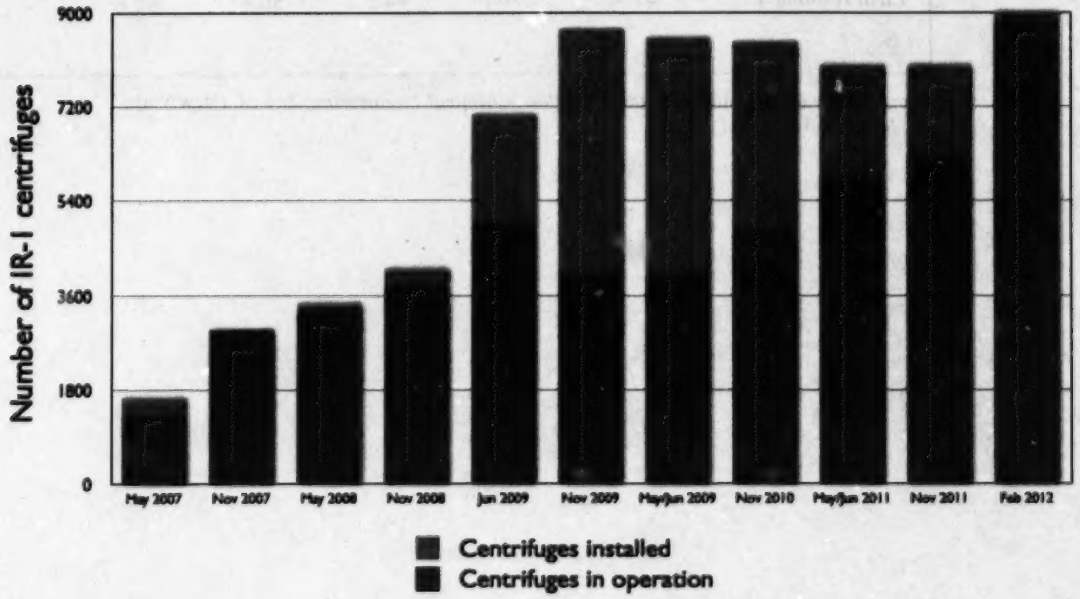
Source: Manson Benedict and others, *Nuclear Chemical Engineering*, 2nd ed. (New York, McGraw-Hill, 1981), p. 855.

Annex V

Advanced centrifuges



IR-1 centrifuges



Source: GOV/2012/9 and previous IAEA reports.

Annex VI

Iranian carbon fibre production

The Panel's insight into indigenous carbon fibre production capacity of the Islamic Republic of Iran is limited to a single media report including a several-minute-long video tour of its production facilities, including the operation of its oxidation oven, furnace and spool-winders.[a] In the report, it is noted that the Iranian-produced carbon fibre is intended for the country's aerospace and energy sectors. The following describes the multi-step process of producing carbon fibre in the context of the Islamic Republic of Iran's facilities reviewed in the present report. The Panel consulted two independent industry experts in the production of carbon fibre in its assessment of the media report.

In the first stage of the production process, carbon fibre consists of pale-coloured or white, fine, fibrous strands on rolls known as creels; the fibres are unspooled as they feed into an oxidation oven where they turn progressively darker shades of amber and eventually black. Problems can occur at this stage if the fibres twist or become uneven and broken, as they appear to in the video of the Iranian production line. According to one of the experts consulted by the Panel, the oven appears to run more slowly than a more modern oxidation oven, but is judged to be in reasonable condition. The Panel notes that oxidation ovens can be purchased without licences from many suppliers. It is also not known whether the Islamic Republic of Iran has access to the precursor chemical, polyacrylonitrile, for the production of high-grade carbon fibre.

In the second stage of the production process, the now black fibres go through the process of carbonization, in which they are processed through a series of furnaces, from low to high temperature, to 2,000° C (in more sophisticated carbon fibre production, there would be a third, ultra-high-temperature furnace, which is subject to stringent export controls). The Iranian furnaces appear to be some 30 years old. This step in the process produces hydrogen cyanide, a dangerous chemical for which monitors or detectors are needed.

In the third step of the process, the surface of the fibres is treated with a chemical abrasion process to make it rough and more receptive to a coating applied in the next stage. The Iranian chemical abrasion equipment was judged not to be modern but capable of doing the job.

A glue-like treatment, referred to sizing, is applied to the surface of the fibres in the next stage, after which the fibres are dried and rewound on spool-winders. The Islamic Republic of Iran's spool-winders appear to be used and not of recent vintage.

The carbon fibre produced in the facility viewed in this clip is assessed by experts in carbon fibre production and manufacturing not to be suitable for use in Iranian centrifuges.

[a] See www.youtube.com/watch?v=tP_2HakdKCA.

Annex VII

Export controls and carbon fibre

In its resolution 1929 (2010), the Security Council barred the transfer to the Islamic Republic of Iran of items contained in document INFCIRC/254/Rev.7/Part 2. With regard to carbon fibre, this document defines as sensitive:

"Fibrous or filamentary materials" and prepregs, as follows:[a]

a. Carbon or aramid "fibrous or filamentary materials" having either of the following characteristics:

   1. A "specific modulus" of 12.7 x 10^6m or greater; or

   2. A "specific tensile strength" of 23.5 x 10^4m or greater;

b. Glass "fibrous or filamentary materials" having both of the following characteristics:

   1. A "specific modulus" of 3.18 x 10^6m or greater; and

   2. A "specific tensile strength" of 7.62 x 10^4m or greater;

c. Thermoset resin impregnated continuous "yarns", "rovings", "tows" or "tapes" with a width of 15 mm or less (prepregs), made from carbon or glass "fibrous or filamentary materials" specified in Item 2.C.7.a. or Item 2.C.7.b.

[a] Item 2.C.7.a. does not control aramid "fibrous or filamentary materials" having 0.25 per cent or more by weight of an ester-based fibre surface modifier.

Annex VIII

Iranian rockets and missiles

Missile	*Fuel type*	*Estimated range*	*Payload*
Fajr-3	Solid	45 km	45 kg
Fajr-5	Solid	70-80 km	90 kg
Fateh-110	Solid	200 km	500 kg
Ghadr-1	Liquid	1 600 km	750 kg
Iran-130/Nazeat	Solid	90-120 km	150 kg
Nazeat-6	Solid	100 km	150 kg
Nazeat-10	Solid	140-150 km	250 kg
Oghab	Solid	40 km	70 kg
Qiam 1	Liquid	500-1 000 km	500 kg
Sejil/Ashura	Solid	2000-2 500 km	750 kg
Shahab-1	Liquid	300 km	1000 kg
Shahab-2	Liquid	500 km	730 kg
Shahab-3	Liquid	800-1 300 km	760-1 100 kg
Zelzal-1	Solid	125 km	600 kg
Zelzal-2	Solid	200 km	600 kg

Source: Information provided by Member States and "Iran's Ballistic Missile Capabilities: A Net Assessment", *IISS*, 2010.

Annex IX

Incidents inspected by the Panel in 2011-2012

Incident	*Item*	*United Nations item number*	*United Nations class*	*Quantity*	*Weight*	*Country of origin*	*Country of seizure*	*Country of destination*	*Mode of transportation*
Seizure by the International Security Assistance Force on 5 February 2011 of missiles in Southern Afghanistan, reported to the Committee in a letter dated 21 April 2011	122-mm rockets	n/a	n/a	48	Approx. 64 kg	Highly probable Islamic Republic of Iran (continuing investigation by the Panel)	Afghanistan	Afghanistan	Truck
	Fuses	n/a	n/a	49	0.68-0.70 kg				
	7.62-mm ammunition	n/a	n/a	1 000	n/a				
Seizure by the Turkish authorities on 19 March 2011 of arms and ammunition, reported to the Committee in a letter dated 28 March 2011	AK-47 assault rifles	n/a	n/a	60	n/a	Islamic Republic of Iran	Turkey	Syrian Arab Republic	Aeroplane
	BKC (Bixi) machine guns	n/a	n/a	14	n/a				
	BKC/AK-47 ammunition	n/a	n/a	7 920	n/a				
	60-mm mortar shells	n/a	n/a	560	n/a				
	120-mm mortar shells	n/a	n/a	1 288	n/a				

Incident	*Item*	*United Nations item number*	*United Nations class*	*Quantity*	*Weight*	*Country of origin*	*Country of seizure*	*Country of destination*	*Mode of transportation*
Seizure by the Turkish authorities on 15 February 2011 of arms and related materiel, reported to the Committee in a letter dated 12 January 2012	Powder M9	27	1.1D	2 boxes	890 kg	Islamic Republic of Iran	Turkey	Syrian Arab Republic	Truck
	Propelling charge	160	1.3C	2 boxes	1 400 kg				
	Slow-burning material	1325	4.1	1 box	30 kg				
	Sensitive material	121	1.1G	1 box	10 kg				
	Rocket fuel	186	1.3C	6 pallets	2 643 kg				
	RDX	483	1.1D	2 pallets	1 700 kg				

Annex X

Vessels and entities controlled by the Irano Hind Shipping Company

List of vessels and registered owners (R/O)

Vessel	*Flag*	*International Maritime Organization No.*	*Registered owner*	*Country of registered owner*
Teen	Malta	9101649	BIIS Maritime Limited	Malta/Panama
Attar	Malta	9074092	ISIM ATR Limited	Malta
Sattar	Malta	9040479	ISIM Sat Limited	Malta
ISI Olive	Bolivia	9003237	ISIM Olive Limited	Malta
Amin	Bolivia	9422366	ISIM Amin Limited	Malta
Sinin	Malta	9274941	ISIM Sinin Limited	Malta
Tour	Bolivia (Plurinational State of)	9364112	ISIM Tour Limited	Malta
Taj Mahal	Malta	9459046	Irano Hind Shipping Company	Islamic Republic of Iran (not in operation)

List of other companies related to the Irano Hind Shipping Company

ISI Maritime Limited

ISIM Taj Mahal Limited

ISIM Sea Chariot Limited

ISIM Sea Crescent Limited

Imir Limited

List of container carriers previously controlled by the Irano Hind Shipping Company

Vessel	*Flag*	*International Maritime Organization No.*	*Registered owner*	*R/O Registered*
Neri	Malta	9148491	Bai Handelas Limited	Malta
Melish	Malta	9148518	Bai Lai Limited	Malta

Note: Bai Handelas Limited and Bai Lai Limited are owned by Transatlantik Denizcilik Limited (registered in Turkey).